1. PHYLOGENETIC ANALYSES

1.1 Taxon sampling and sequencing

We used tools in the GenBank browser PhyloTA[1] to gather sequence data for African cichlid taxa for the nine genes used in phylogenetic reconstruction (see Supplementary Table 1). As a check on the GenBank sequence data, we built single-gene trees and excluded from the dataset sequences where problems in species identification were apparent. We included sequences from all African cichlid taxa with unique species names, and in most cases excluded taxa not identified to species. We assembled the full genetic dataset with the help of functions in the R packages APE[2] and Phyloch[3], and aligned the dataset with MAFFT[4].

Species sampled and GenBank numbers associated with gene sequences used in phylogenetic analyses are listed in Supplementary Table 1.

DNA was extracted from fin clips or muscle tissue using a standard phenol-chloroform extraction procedure. Two mitochondrial regions, the control region and NADH2 were amplified. PCR amplification of products, purification of PCR products, and sequencing of control region followed the protocol described in Joyce et al.[5]. The entire mitochondrial control region was amplified using forward primer

HAPThr-2+4F 5'-CCTACTCCCAAAGCTAGGATC-3'

and reverse primer

FISH12s 5'- TGCGGAGACTTGCATGTGTAAG -3'.

PCR products were cleaned using exonuclease and shrimp alkaline phosphatase, and a combination of the amplification primers and two internal primers, a forward primer

Dloopint 5'-AGCCCACCATCAGTTGATT-3'

and reverse primer

HapDloop 5'-GGTTTGCAGGAGTCTTAGAG-3'.

These primers were used for cycle sequencing in both directions using DTCS quickstart (Beckman Coulter) according to the manufacturer's instructions, adding 1M betaine to the sequencing reaction. The NADH2 gene was amplified with primers GLN forward

(5'-CTACCTGAAGAGATCAAAAC-3')

and ASN reverse

(5'-CGCGTTTAGCTGTTAACTAA-3').

The PCR products were purified and sequenced in both directions as described above using the two amplification primers and two internal primers ND2.1int

(5'-ACAGGTCAATGAGAAATTCAACAA-3')

and reverse primer ND2.4int

(5'-AAGCCCTTGTTTGGTTAGTTCT-3')

to obtain the entire segment (1047bp) of the NADH2 gene. All sequences were resolved using a CEQ Automated Capillary Sequencer (Beckman Coulter).

1.2 Phylogenetic analyses

We used RAxML for phylogenetic analyses[6]. We partitioned the dataset by gene, using a GTR+gamma model of sequence evolution for each gene partition. We completed a full maximum likelihood search and 100 bootstrap replicates of RAxML's rapid bootstrap algorithm[7]. To account for uncertainty in branch length estimates as well as topology, we estimated branch lengths for each bootstrap replicate topology in RAxML, giving a total of 101 trees with topology and branch length estimates.

To ultrametricize and time-calibrate this set of trees, we used PATHd8[8]. We used four geological dates to time-calibrate the trees (see Supplementary Figure 1). Two of these dates were associated with the breakup of Gondwana: the African-Madagascar split (121-165 million years ago), placed at the node representing the most recent common ancestor of mainland and Madagascan (Ptychochromine) cichlids; the Madagascar-India split (63-88 million years ago), placed at the node representing the most recent common ancestor of Indian and Madagascan Etropline cichlids[9]. We also included the age of the earliest known fossil *Oreochromis* (6 million years; [10]), placed at the node representing the common ancestor of *Oreochromis* and *Sarotherodon* (these genera cannot be distinguished based on fossilized characters, thus this placement is conservative). Additionally, we used the age of Lake Nabugabo (5000 years[9]) as a recent calibration point. Because cichlids from Lake Nabugabo are not reciprocally monophyletic, we applied this divergence time to the node representing each Nabugabo species and its most recent common ancestor in Lake Victoria, repeating this procedure for each of the four Nabugabo species included in the tree, and replicating this procedure over the set of 101 trees. We then drew 95% confidence intervals on node ages from the distribution of branching times estimated from these sets of calibrated ultrametric trees.

The best maximum likelihood topology from a full RAxML search, with bootstrap values from 100 rounds of bootstrapping, is provided in Supplementary Figure 1. To incorporate our phylogeny into regression analyses incorporating the effects of phylogeny, we trimmed the single best ML tree to include only lineages that occur in lakes, and a single taxon for each lake in which cichlids have diversified. Taxa included in the trimmed tree (corresponding to those in Figure 1a), as well as confidence intervals for the time-calibrated tree, are given in Supplementary Figure 2.

For lineages present in multiple lakes, we added a tip to the tree for each instance where the lineage is found in a unique lake, such that each lineage found in multiple lakes is represented as a polytomy with a tip corresponding to each lake where it is present. We set branch lengths on these added tips to have a total length that matched that expected under a pure birth model. To do this, we follow Nee[11] in considering the branching times of a phylogeny that includes *n* species. Each time interval t_i represents the waiting time between successive speciation events on the tree. Under a pure-birth model with birth rate *b*, these waiting times are all drawn from exponential distributions with rate parameters that depend on the number of extant species in the tree at that particular time. Total tree depth (*T*) is the sum of these intervals:

$$T = \frac{1}{b} + \frac{1}{2b} + \ldots + \frac{1}{nb} \tag{1}$$

The expected value for the total evolutionary history in the tree (*H*), then, is:

$$H = 1\frac{1}{b} + 2\frac{1}{2b} + \ldots + n\frac{1}{nb} = \frac{n}{b} \tag{2}$$

Solving for b in (1) and substituting into (2) we have:

$$H = \frac{nT}{1 + \frac{1}{2} + \ldots + \frac{1}{n}} = \frac{nT}{\sum_{i=1}^{n} 1/i} \tag{3}$$

[1] EAWAG Centre for Ecology, Evolution and Biogeochemistry, Kastanienbaum, Switzerland; [2].Institute of Ecology and Evolution, University of Bern, Switzerland; [3] Department of Ecology and Evolutionary Biology, Cornell University, Ithaca NY; [4] Fuller Evolutionary Biology Program, Cornell University Lab of Ornithology, Ithaca, NY; [5] Department of Biological Sciences, University of Idaho, Moscow, ID

2. DIVERSIFICATION STATE, TRAIT AND ENVIRONMENTAL DATA

2.1 Data included and source information

Lake physical and environmental can be found in the Dryad data repository (http://dx.doi.org/10.5061/dryad.5g6312br). Lake surface areas that were not reported in the literature were measured using distance-calibrated Google Earth satellite images and the software ImageJ[12]. Net solar radiation is the difference between the influx of solar radiation and the reflectance of heat energy back into space. We used the average of monthly values from 2010, obtained from the NASA Langley Research Center Atmospheric Science Data Center.

We obtained information about the distribution of large predatory fish of the genera *Lates*, *Hydrocynus* and *Hepsetus* from FishBase[13]. Trait data have been deposited in the Dryad data repository (http://dx.doi.org/10.5061/dryad.5g6312br).

2.2 Time for diversification

We calculated "time for diversification" for lineages using either the midpoint of geological age estimates for the lake (either most recent desiccation or basin age, if no evidence for desiccation exists) or the median stem age of the group estimated from our calibrated molecular phylogenies. If both ages were available we used the geological age of the lake, with the exception of lakes where radiating or colonizing groups differ substantially in age (e.g. Lake Tanganyika, Lake Malawi). Previous work has used similar approaches, combining geological and molecular genetic information to assess relative tempos of speciation[14,15]. The times for diversification that we inferred for all lineages in the dataset, and reference information for geologically-based dates, are archived in the Dryad data repository (http://dx.doi.org/10.5061/dryad.5g6312br).

Because of potential error arising from combining molecular phylogenetic estimates of clade age with geologic dates, we also did analyses using only geologically-based lake ages (see section 4 below and Supplementary Tables 3 and 4). The results of these analyses are qualitatively identical to those using time for diversification.

2.3 Diversification "thresholds"

We coded each lineage in each lake as one of two diversification states – "diversifying" or "nondiversifying" – using 2 different thresholds to identify diversifying lineages. At the lowest threshold, we identified any lineage that had undergone at least one intralacustrine speciation event. Under this criterion, any lineage that had at least one endemic species in a lake co-occurring with its sister taxon (either a widespread species or a lake endemic itself) would be coded as diversifying. Single endemic species not co-occurring with a sister taxon were not coded as diversifying. As an additional test for identifying multi-species radiations, we coded lineages as diversifying only if they had produced at least 5 endemic species within a given lake.

2.4. Treating radiation as a binary variable

In this study, we focus on explaining the presence and absence of diversification, not the species richness of diversifying lineages. There are two major reasons we made the decision to treat the data this way: 1. We here ask if there are lineage-specific or environmental properties that promote intralacustrine diversification. This is a different question than asking what determines the species richness of diversifying lineages. 2. Because most lineages have colonized lakes and have not subsequently diversified, the species richness dataset is highly skewed towards 0-values; the response variable therefore has a strongly zero-skewed distribution. Therefore, the binary framework is more analytically appropriate for the dataset and the question we seek to answer. However, see section 5.3 below for additional analyses that treat both our primary question (binary "radiation-or-not") and species richness.

3. CORRELATION BETWEEN PREDICTOR VARIABLES

We checked for collinearity between predictor variables prior to including variables together in multiple regression models. We calculated Pearson correlation coefficients (r^2) for all pairs of continuous predictor variables (see Supplementary Figure 3). Among continuous predictor variables, lake depth and time for diversification

were strongly positively correlated ($r^2 = 0.77$), and latitude and environmental energy were strongly negatively correlated ($r^2 = -0.82$).

The collinearity between lake depth and time for diversification is not unexpected, as deeper lakes are generally older because they are less sensitive to climate-driven desiccation. Greater depth could influence diversification by increasing temporal lake stability, and/or through increased habitat dimensionality. To examine the relative explanatory power of depth versus time, we analyzed a large subset of the data, excluding lakes deeper than 150 meters, and thereby substantially reducing collinearity between depth and time ($r^2 = 0.25$). We then compared models incorporating time, depth, and depth + time as predictors of diversification state. We find that depth alone predicts diversification better than does time alone at diversification threshold 1 (depth alone vs time alone: ΔAIC 2.996; vs depth + time: ΔAIC 1.696) and at diversification threshold 5 (depth alone vs time alone: ΔAIC 1.308; vs depth + time: ΔAIC 0.541). We therefore included depth alone in multiple regression models presented in the main text. We additionally did multiple regression analyses including time and excluding depth, and as predicted for highly correlated predictor variables, time behaves qualitatively identically to depth in these models (results not shown).

Because of high collinearity between energy (measured as net radiation) and latitude ($r^2 = -0.82$), we included the residuals of the linear regression of latitude as a function of net radiation, instead of raw latitude, in multiple regression models. This approach allowed us to ask whether variation in latitude influences cichlid diversification beyond the effects of available energy. The residuals of latitude were not strong predictors of diversification in any model set in multiple regression analyses, and excluding them as a predictor variable produced qualitatively identical results.

For binary predictor variables, we used the r^2 equivalent suggested by Menard[16], r^2_L, as an assessment of collinearity. This metric is based on the likelihood of the model with only the intercept (L_O) relative to the model with the predictor variables included (L_M), where

$$r^2_L = 1 - \ln(L_O)/\ln(L_M).$$

We removed one variable from each pair of predictor variables with r^2 (or r^2_L) of greater than 0.7 after testing models including variables with correlations higher than this value proved to cause analytical problems (inflations of standard error in parameter estimation, a diagnostic of collinearity problems in logistic regression[17]). Supplementary Table 2 provides r^2_L for all pairs of binary predictor variables. Mouthbrooding and polygamous mating systems were the only pair of variables with r^2_L greater than 0.6, so we removed mouthbrooding from the multiple regression models shown in the main text.

4. SINGLE PREDICTOR VARIABLE ANALYSES

We evaluated the relationships between single predictor variables and diversification state using phylogenetic logistic regression[18] (see Methods).

Because Lake Tanganyika is an outlier in terms of depth and age (it is more than twice as old and deep as any other lake in the dataset), we ran models both with and without lineages present in that lake. At both thresholds used to identify diversifying lineages, the strongest and most consistent associations with radiation were for lake depth, lake age, and time for diversification (see Supplementary Tables 3 and 4).

Ives and Garland's[18] method infers the parameter *a*, a measure of phylogenetic signal in the regression, as part of the phylogenetic logistic regression procedure, and uses this inferred measure of phylogenetic signal to modulate the strength of the phylogenetic term in the regression parameter estimation. The parameter *a* is defined such that values of -4 or less are considered to have negligible phylogenetic signal, and values greater than 1 indicate strong phylogenetic signal. Inferred *a* values for the regression of single predictor variables on radiation state are given in Supplementary Tables 6 and 7. No inferred *a* values exceed 0, indicating that no regressions have very strong phylogenetic signal, but strength of phylogenetic signal varies among predictor variables, and generally is higher in regressions of traits than it is in regressions of environmental variables. Note that the phylogenetic signal for the regression of these

variables on radiation state may differ substantially from phylogenetic signal in each variable alone.

At the lower diversification threshold (see Supplementary Table 3), both time for diversification and lake age are strong positive predictors of diversification both with and without Lake Tanganyika included in the dataset. Among extrinsic factors, increased lake depth and the absence of predators are significant predictors of radiation both with and without Lake Tanganyika. With taxa from Lake Tanganyika excluded, there are significant negative relationships with lake surface area and with latitude. Among intrinsic traits, sexual dichromatism is a significant predictor of radiation both with and without taxa from Lake Tanganyika included. Mouthbrooding is a significant predictor of radiation for the complete dataset, and both generalized and haplochromine-type egg dummies are significant predictors of radiation when taxa from Lake Tanganyika are excluded.

At the higher diversification threshold, (Supplementary Table 4), lake age and time for diversification are again strongly associated with radiation both with and without taxa from Lake Tanganyika included. Lake depth is also a strong predictor of radiation both with and without taxa from Lake Tanganyika. Increased energy, and decreased latitude, are significantly associated with radiation for the whole dataset, but are not significant predictors with taxa from Lake Tanganyika excluded. Mouthbrooding is a significant predictor of radiation for the complete dataset only, and the presence of egg dummies (both generalized and haplochromine-type) and sexual dichromatism are significant predictors of radiation with taxa from Lake Tanganyika excluded.

5. MULTIPLE REGRESSION ANALYSES

5.1 Model Averaging Procedure

To assess the impact of predictor variables on the fit of multiple regression models, we used an AICc-based model averaging approach following Burnham and Anderson[19] and Kisel and Barraclough[20]. To do this, we fitted logistic regression models in RR Development Core [21], using the function glm(), that included all possible additive models given our set of predictor variables. We calculated the Akaike weight of each model by first calculating relative likelihoods for each model as exp(-0.5*ΔAICc). The Akaike weight equals the relative likelihood divided by the sum of the relative likelihoods for all models. We then calculated the relative importance (RI) for each predictor variable, as the sum of relative Akaike weights for models in which they appear. RI values scale from 0 to 1, where a variable with a score of 0 is associated with very low Akaike weights and 1 is consistently associated with high weights. We also calculated model-averaged estimates of regression parameters and standard error values, calculated as the sum of the parameter estimates for each model including that predictor, multiplied by the relative Akaike weight of each of those models.

As an additional test of the robustness of our multiple regression results, we conducted a cross-validation test. We took 500 random draws of a subset of the lineages in the full dataset (75% of the total) and conducted the model averaging procedure as described above on these data subsets.

5.2 Multiple regression results

The full multiple regression model results, which are summarized in Figure 2 in the main text, are given in Supplementary Tables 5 and 6. Results are concordant across diversification thresholds. Relative importance values decrease for the higher diversification threshold. This is expected, as the number of instances of observed diversification decreases with increased threshold, and thus the power to observe significant associations decreases. The top predictor variables are consistent across thresholds, with one exception. At threshold 5, lake area is no longer a significant predictor of diversification (for thresholds 1 it is a strong negative predictor of diversification). This indicates that the negative association between lake area and diversification is driven by very small radiations (< 5 species) in very small lakes.

One possibility for the negative association between lake area and diversification that we discuss in the main text is ascertainment bias. While data on cichlid species presence is generally present for all large lakes of Africa, data on cichlid species presence in very small lakes is rare. Small lakes included in the dataset are frequently those known for their endemic cichlids (e.g. Cameroonian crater lakes; Guinas Sink Hole). Furthermore, although our results demonstrate that the occurrence of intralacustrine speciation is not limited by lake area (see main text), species richness in cichlid radiations is limited by lake area (see Seehausen[22], Wagner et al. in prep). Therefore, if the small lakes included in the dataset disproportionately represent cases of radiation (more so than larger lakes), and small lakes are constrained in species richness of their radiations (by virtue of their area), the significant negative area-diversification relationship would be expected to disappear as species richness threshold increases. This is what we observe.

The cross-validation test produced average relative importance values for all variables that are concordant with values for the full dataset (Supplementary Figure 4; compare to Figure 2a).

5.3 Hurdle poisson regression analysis

As a further test of the robustness of the results of our logistic regression modeling approach, we used hurdle Poisson regression implemented in the R package MCMCglmm [23,24]. Hurdle Poisson regression models two latent variables associated with the response: 1) the probability that the response is zero or not, and 2) the probability of the response modeled as a Poisson distribution without the observed zero-values. Our response variable for these analyses is the number of speciation events within each colonizing lineage, instead of these data transformed to binary (e.g. "radiating-or-not") as we have treated it elsewhere in the paper. We use a hurdle Poisson model for two reasons. First, our response variable is heavily zero-inflated; and second, we were specifically interested in investigating the presence of radiation separately from the species richness of those radiations.

MCMCglmm takes a Bayesian approach to fitting general linear models that are analytically intractable using traditional likelihood approaches. An additional advantage for comparative biologists is that MCMCglmm can account for phylogeny by treating the phylogenetic variance covariance matrix as a random effect in the regression model [24]. To use this approach, we drew 100 trees randomly from our set of bootstrap replicate trees and replicated the analyses on each of these 100 trees. Because the method requires fully resolved trees, we randomly resolved polytomies and replaced zero-length branches with near-zero length branches (0.000001).

We fit multivariate models including variables from the reduced models also used in phylogenetic logistic regression analyses (variables surface area, depth, energy, elevation, haplochromine egg dummies, and sexual dichromatism). Fixed effects included additive terms for both binary and Poisson effects for each of these predictor variables. In addition to including phylogeny as a random effect, we included lake identity as a random effect, to account for potential autocorrelation in lake identity due to the presence of multiple lineages in the same lake.

We used priors with an inverse Wishart distribution with nu = 0.002, which is equivalent to an inverse gamma distribution with shape-scale equal to 0.001. We fixed the residual variance for the binary process portion of the model, as this variance is not estimated in the regression. Our prior specification therefore took the form:

prior = list (R = list (V=diag(2),n = 0.002, fix=2), G = list (G1 = list (V = diag(2), n = 0.002),(G2 = list (V = diag(2), n = 0.002))))

Where R corresponds to the prior matrix associated with the residual variance, and G corresponds to the matrices associated with the random effects.

We assessed convergence of the model through inspection of plots of the model deviance through time, and set the burn-in after a clear plateau of deviance values. We assessed autocorrelation in parameter values through the run with plots of parameter estimates through time and optimized sampling of the MCMC chain to minimize autocorrelation. We ran the model such that effective sample sizes of all parameter estimates exceeded 100. To optimize all of the above conditions, we ran the analysis on each replicate tree for 100 million generations, with 2.5 million generations of burn-in and sampling the chain every 2000 generations. For examples of run convergence diagnostics, see Supplementary Figure 5.

Results from the binary portion of the hurdle Poisson regression analysis were concordant with the results from the logistic regression

analyses for the full dataset and also with data from Lake Tanganyika excluded. Lake depth, lake surface area, and sexual dichromatism were strongly significant predictors of diversification in the reduced models we tested; these three variables are also the top-performers in logistic regression both with and without Lake Tanganyika (Supplementary Figure 6). When data from Lake Tanganyika is excluded, depth remains a strong predictor of radiation, but energy also becomes a predictor of radiation (Supplementary Figure 6b). The Poisson portion of the hurdle regression did not identify any of the tested variables as significant predictors of species richness in radiating lineages, with or without data from Lake Tanganyika. That is, this analysis showed that using this approach, our predictor variables can predict whether lineages radiate or not, but not the number of species that evolve in these radiations.

5.4. Interaction effects
Our main results show significant additive effects between environmental variables and lineage-specific traits in predicting cichlid radiation. We were interested in further testing whether there is evidence for non-additive interaction effects between extrinsic and intrinsic variables. We tested for this in two ways:

1) We tested for interactions between two pairs of variables: sexual dichromatism and lake depth, and sexual dichromatism and lake surface area, in a Poisson hurdle model including those three variables. We chose these three variables because they were the significant predictors in our prior hurdle Poisson analyses (see section 5.3 above). We estimated regression parameters for each variable alone and for the two interactions described above, estimating effects for the binary portion of the model (as our previous tests showed no evidence for significant effects in the Poisson portion of the hurdle model; Section 5.3 above). We ran the analysis on the single best ML tree, for 10 million generations with a burn-in of 500,000 generations. This model gave evidence for a significant interaction term between lake depth and sexual dichromatism (p = 0.04), but no significant effects for the interaction of dichromatism and lake surface area. As expected, the main additive terms (sexual dichromatism, lake depth, and lake surface area) were all significant predictors of radiation.
2) We tested for an interaction between sexual dichromatism and lake depth in a hurdle Poisson model including those two variables alone plus their interaction. We again only estimated parameters for the binary portion of the model, and used the run parameters described above. The results of this model did not provide evidence for a significant depth-sexual dichromatism interaction effect (p = 0.25), but depth and dichromatism were each significant predictors of radiation.

These analyses leave open the possibility that there is a weak interaction effect between lake depth and sexual dichromatism in addition to the clear additive effects of these variables in predicting cichlid radiation.

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Supplementary Table 1| Species used in full phylogenetic analysis, and GenBank numbers of genes associated with these species. Numbers in bold are new sequences.

Species	ND2	16S	CR	CytB	Tmo-4c4	ENC1	Ptr	S7 Intron	SH3PX2
Alcolapia alcalicus	GQ167781	GQ167970	15428641	18072278	GQ168158	GQ168284	GQ168033	GQ168095	GQ168221
Alcolapia grahami	--	--	18072409	18072346	--	--	--	--	--
Alcolapia latilabris	--	--	18072788	18072760	--	--	--	--	--
Alcolapia ndalalani	--	--	18072780	18072748	--	--	--	--	--
Alticorpus mentale	--	--	62637864	--	--	--	--	--	--
Alticorpus pectinatum	AF305287	--	22531769	--	--	--	--	--	--
Altolamprologus calvus	DQ055011	--	509409	509407	--	--	--	--	--
Altolamprologus compressiceps	DQ055022	18182226	509408	18265830	--	--	--	--	--
Aristochromis christyi	EF585282	18182227	--	--	--	--	--	--	--
Asprotilapia leptura	AY337772.1	--	313039	313037	--	--	--	--	--
Astatoreochromis alluaudi	EU753923.1	7576476	7595677	18265818	U70339	--	--	--	--
Astatotilapia aeneocolor	**JQ950374**	--	--	--	--	--	--	--	--
Astatotilapia bloyeti	**JQ950375**	--	2394105	2394123	--	--	--	--	--
Astatotilapia brownae	--	--	--	2394141	--	--	--	--	--
Astatotilapia burtoni	**JQ950376**	--	30143252	313030	--	--	--	--	--
Astatotilapia calliptera KS	EU753934.1	--	--	EU753883	--	--	--	--	--
Astatotilapia calliptera LM	AY930090	134268647	22531760	134303313	EF470867	--	--	--	--
Astatotilapia calliptera LZ	**JQ950377**	--	--	--	--	--	--	--	--
Astatotilapia desfontainii	**JQ950378**	--	--	--	--	--	--	--	--
Astatotilapia elegans	**JQ950379**	--	--	--	--	--	--	--	--
Astatotilapia flavijosephi	**JQ950380**	--	47057416	--	--	--	--	--	--
Astatotilapia macropsoides	**JQ950381**	--	--	--	--	--	--	--	--
Astatotilapia nubila	AF305241	--	22531723	--	--	--	--	--	--
Astatotilapia sp. "orange shoulder"	**JQ950382**	--	--	--	--	--	--	--	--
Astatotilapia paludinosa	AY930107	--	60550047	--	--	--	--	--	--
Astatotilapia piceata	--	18182248	48773071	--	--	--	--	--	--
Astatotilapia sp. "red chest"	**JQ950383**	--	--	--	--	--	--	--	--
Astatotilapia sparsidens	--	--	2394110	2394137	--	--	--	--	--
Astatotilapia stappersii	AY930046.1	--	60549994	--	--	--	--	--	--
Astatotilapia tweddlei	**JQ950384**	--	**JQ950405**	--	--	--	--	--	--
Astatotilapia velifer	--	--	7595614	2394121	--	--	--	--	--
Aulonocara baenschi	--	18182228	--	--	--	--	--	--	--
Aulonocranus dewindti	AY337782.1	--	33355534	313033	--	--	--	--	--
Aulonocara jacobfreibergi	--	--	11602481	--	--	--	--	--	--
Aulonocara stuartgranti	EU661720	--	--	--	--	--	--	--	--
Baileychromis centropomoides	AY682509	--	55275999	--	--	--	--	--	--
Bathybates fasciatus	AY663732	--	52221335	52221306	--	--	--	--	--
Bathybates ferox	AY663736	GQ168020	52221339	313040	GQ168209	GQ168335	GQ168083	GQ168146	GQ168272
Bathybates graueri	AY663723	--	52221327	52221290	--	--	--	--	--
Bathybates hornii	AY663735.1	--	52221338	52221312	--	--	--	--	--
Bathybates leo	AY663729	--	52221331	52221300	--	--	--	--	--
Bathybates minor	AY663721	--	52221323	52221284	--	--	--	--	--
Bathybates vittatus	AY663727	--	52221329	52221296	--	--	--	--	--
Benthochromis melanoides	AY682512.1	--	55276001	--	--	--	--	--	--
Benthochromis sp.	--	--	--	--	GQ168211	GQ168337	GQ168085	GQ168148	GQ168274
Benthochromis tricoti	AF317264	--	18029972	18265832	--	--	--	--	--
Boulengerochromis microlepis	EF679235	5114128	509464	509463	GQ168197	GQ168323	GQ168071	GQ168134	GQ168260
Buccochromis atritaeniatus	--	--	13235053	--	--	--	--	--	--
Buccochromis heterotaenia	EU661719.1	--	--	--	--	--	--	--	--
Buccochromis lepturus	U07241	--	--	--	--	--	--	--	--
Buccochromis nototaenia	--	--	62637867	--	--	--	--	--	--
Buccochromis oculatus	AF305300	--	22531782	--	--	--	--	--	--
Callochromis macrops	U07242	--	33355580	33356048	--	--	--	--	--
Callochromis melanostigma	--	--	33355576	33355998	--	--	--	--	--
Callochromis pleurospilus	AY337771.1	18182229	313055	313053	--	--	--	--	--
Callochromis stappersii	AY337775	--	33355578	33356018	--	--	--	--	--
Cardiopharynx schoutedeni	AY337791.1	--	33355531	313056	--	--	--	--	--
Chalinochromis brichardi	EF679241	5114130	509739	509737	--	--	--	--	--
Chalinochromis popeleni	U07244	33090454	--	--	--	--	--	--	--
Champsochromis spilorhynchus	U07245	--	529343	--	--	--	--	--	--
Cheilochromis euchilus	AY930092.1	--	60550032	--	--	--	--	--	--
Chetia brevicauda	EU753924.1	--	58866308	--	--	--	--	--	--
Chetia flaviventris	EU753926.1	--	58866303	--	--	--	--	--	--
Chilochromis duponti	GQ167776	GQ167965	--	--	GQ168153	GQ168279	GQ168028	GQ168090	GQ168216
Chilotilapia rhoadesii	--	--	62637872	--	--	--	--	--	--
Chromidotilapia guntheri	AF317270.1	--	--	--	--	--	--	--	--
Copadichromis borleyi	AF305308	--	22531790	--	--	--	--	--	--
Copadichromis chrysonotus	--	--	62637869	--	--	--	--	--	--
Copadichromis conophoros	--	--	541597	--	--	--	--	--	--
Copadichromis cyclicos	--	--	541595	--	--	--	--	--	--
Copadichromis eucinostomus	--	--	541593	--	--	--	--	--	--
Copadichromis mbenjii	EF585255	--	--	--	--	--	--	--	--
Copadichromis prostoma	EU661715	--	--	--	--	--	--	--	--
Copadichromis quadrimaculatus	AF305310	--	22531792	--	--	--	--	--	--
Copadichromis thinos	--	--	541602	--	--	--	--	--	--
Copadichromis virginalis	AF305281	--	22531764	--	--	--	--	--	--
Corematodus taeniatus	--	--	62637874	--	--	--	--	--	--
Ctenochromis horei	AY930100.1	--	34495295	38202260	--	--	--	--	--
Ctenochromis pectoralis	EU753938.1	--	--	2394143	--	--	--	--	--
Ctenochromis polli	EU753941.1	--	--	--	--	--	--	--	--
Ctenopharynx intermedius	--	--	62637876	--	--	--	--	--	--
Ctenopharynx pictus	EF585254	--	--	--	--	--	--	--	--
Cunningtonia longiventralis	AY682516.1	--	33355529	313049	--	--	--	--	--
Cyathochromis obliquidens	--	--	1881618	--	--	--	--	--	--
Cyathopharynx foae	--	--	50262139	--	--	--	--	--	--
Cyathopharynx furcifer	AY337781.1	--	50262143	313043	--	--	--	--	--
Cyclopharynx fwae	AY930099.1	--	18029958	18265820	--	--	--	--	--
Cynotilapia afra	EF585264	--	58866394	--	--	--	--	--	--
Cyphotilapia frontosa	EF679242	--	393082	18265842	--	--	--	--	--

Cyprichromis cf. leptosoma 'yellow'	--	--	--	58379197	--	--	--	--	--
Cyprichromis leptosoma	AY337786	GQ168023	58379152	18265812	GQ168212	GQ168338	GQ168086	GQ168149	GQ168275
Cyprichromis microlepidotus	AY740354.1	--	58379159	58379279	--	--	--	--	--
Cyprichromis pavo	AY740382	--	58379186	58379285	--	--	--	--	--
Cyprichromis sp. 'jumbo'	--	--	--	18265810	--	--	--	--	--
Cyprichromis sp. 'zebra'	--	--	--	58379283	--	--	--	--	--
Cyprichromis zonatus	AY740377.1	--	58379187	58379337	--	--	--	--	--
Cyrtocara moorii	AY930089.1	18182230	529344	--	--	--	--	--	--
Dimidiochromis compressiceps	EF585267	--	13235093	--	--	--	--	--	--
Dimidiochromis kiwinge	AF305322	--	22531804	--	--	--	--	--	--
Dimidiochromis strigatus	--	18182231	--	--	--	--	--	--	--
Diplotaxodon aeneus	--	--	62637885	--	--	--	--	--	--
Diplotaxodon apogon	--	--	62637887	--	--	--	--	--	--
Diplotaxodon argenteus	--	--	62637889	--	--	--	--	--	--
Diplotaxodon brevimaxillaris	AF305264	--	22531746	--	--	--	--	--	--
Diplotaxodon greenwoodi	AF305269.1	134268645	22531752	134303321	EF470868	--	--	--	--
Diplotaxodon holochromis	AF305262.1	--	22531744	--	--	--	--	--	--
Diplotaxodon limnothrissa	AF305261	--	22531738	--	--	--	--	--	--
Diplotaxodon limnothrissa black pelvic	--	--	116178671	--	--	--	--	--	--
Diplotaxodon macrops	AF305266	--	62637903	--	--	--	--	--	--
Diplotaxodon macrops offshore	--	--	116178708	--	--	--	--	--	--
Diplotaxodon similis	AF305271	--	22531756	--	--	--	--	--	--
Docimodus evelynae	EF585252	--	--	--	--	--	--	--	--
Eclectochromis ornatus	EU661717.1	--	--	--	--	--	--	--	--
Ectodus descampsii	AY337790.1	18182232	18029950	313060	--	--	--	--	--
Enantiopus melanogenys	AY682517	--	33355554	33356000	--	--	--	--	--
Enterochromis cinctus	--	--	7595588	--	--	--	--	--	--
Enterochromis sp. "LE"	**JQ950385**	--	--	--	--	--	--	--	--
Eretmodus cyanostictus	AF398220	GQ168019	5918049	5918033	GQ168208	GQ168334	GQ168082	GQ168145	GQ168271
Etia nguti	GQ167777	58199021			GQ168154	GQ168280	GQ168029	GQ168091	GQ168217
Etroplus canarensis	--	AY662713	--	--	AY662816	--	--	--	--
Etroplus maculatus	AP009505.1	EF095604	--	--	AY662818	--	--	--	--
Etroplus suratensis	--	AY263829	--	--	AY662817	--	--	--	--
Exochochromis anagenys	--	--	22531797	--	--	--	--	--	--
Fossorochromis rostratus	EF585281	--	62637908	--	--	--	--	--	--
Gaurochromis simpsoni	--	33090458	7595580	--	--	--	--	--	--
Gaurochromis sp. "LE"	**JQ950386**	--	--	--	--	--	--	--	--
Genyochromis mento	AF305297	--	1881619	--	--	--	--	--	--
Gephyrochromis lawsi	--	--	62637910	--	--	--	--	--	--
Gnathochromis permaxillaris	AY682519	18182233	55276010	18265834	--	--	--	--	--
Gnathochromis pfefferi	EF679245	--	18029974	18265836	--	--	--	--	--
Gobiocichla ethelwynnae	--	58199022			--	--	--	--	--
Gobiocichla wonderi	GQ167778	GQ167967	--	--	GQ168155	GQ168281	GQ168030	GQ168092	GQ168218
Grammatotria lemairii	AY337787.1	18182234	313068	313063	--	--	--	--	--
Greenwoodochromis bellcrossi	AY682523	--	55276012	--	--	--	--	--	--
Greenwoodochromis christyi	AY682525	--	55276016	--	--	--	--	--	--
Haplochromis adolfifrederici	--	--	30143182	--	--	--	--	--	--
Haplochromis astatodon	--	--	30143158	--	--	--	--	--	--
Haplochromis chala	--	--	2394106	2394129	--	--	--	--	--
Haplochromis crebridens	--	--	30143181	--	--	--	--	--	--
Haplochromis gracilior	AY930079	--	30143255	--	--	--	--	--	--
Haplochromis graueri	--	--	30143123	--	--	--	--	--	--
Haplochromis insidiae	AY930077.1	--	30143094	--	--	--	--	--	--
Haplochromis lividus	--	--	7595585	--	--	--	--	--	--
Haplochromis microchrysomelas	--	--	30143162	--	--	--	--	--	--
Haplochromis nigroides	--	--	30143144	--	--	--	--	--	--
Haplochromis obliquidens	AY930097	--	60550037	--	--	--	--	--	--
Haplochromis occultidens	--	--	30143133	--	--	--	--	--	--
Haplochromis olivaceus	--	--	30143126	--	--	--	--	--	--
Haplochromis paucidens	--	--	30143108	--	--	--	--	--	--
Haplochromis sp. "purple yellow"	**JQ950387**	--	--	--	--	--	--	--	--
Haplochromis rubescens	--	--	30143088	--	--	--	--	--	--
Haplochromis scheffersi	--	--	30143097	--	--	--	--	--	--
Haplochromis sp. "crebridens/olivaceus"	--	--	30143113	--	--	--	--	--	--
Haplochromis sp. "Fayoum"	EU753945.1	--	--	--	--	--	--	--	--
Haplochromis sp. "Kanyaboli"	EU753944.1	--	--	--	--	--	--	--	--
Haplochromis sp. "Kisangani"	AY930062.1	--	--	--	--	--	--	--	--
Haplochromis sp. "Mburo Black"	EU753946.1	--	--	--	--	--	--	--	--
Haplochromis sp. nov.	EU753928	--	--	EU753877	--	--	--	--	--
Haplochromis sp. "thick skin"	**JQ950388**	--	--	--	--	--	--	--	--
Haplochromis vittatus	--	--	30143178	--	--	--	--	--	--
Haplotaxodon microlepis	EF437498.1	--	55276018	EF679278	--	--	--	--	--
Haplotaxodon trifasciatus	AY682531	--	55276020	--	--	--	--	--	--
Harpagochromis guiarti	--	--	48773073	--	--	--	--	--	--
Harpagochromis sp. "LE"	**JQ950389**	--	--	--	--	--	--	--	--
Harpagochromis squamipinnis	EU753943.1	--	30143214	--	--	--	--	--	--
Hemibates stenosoma	AY663719.1	--	52221320	52221276	--	--	--	--	--
Hemichromis bimaculatus	--	4091094	--	2394111	--	--	--	--	--
Hemichromis elongatus	AY663714.1	GQ168001	112735225	--	GQ168189	GQ168315	GQ168063	GQ168126	GQ168252
Hemichromis guttatus	--	58199023	--	--	AY662866	--	--	--	--
Hemitilapia oxyrhyncha	EF585277	--	--	--	--	--	--	--	--
Heterochromis multidens	GQ167779	4321412	--	18265806	AF113060	GQ168282	GQ168031	GQ168093	GQ168219
Iodotropheus sprengerae	--	--	1881620	--	--	--	--	--	--
Iranocichla hormuzensis	GQ167830	GQ168018	--	--	GQ168207	GQ168333	GQ168081	GQ168144	GQ168270
Julidochromis affinis	--	--	510122	--	--	--	--	--	--
Julidochromis brichardi	EF462232	--	--	--	--	--	--	--	--
Julidochromis dickfeldi	EF462230	--	--	--	--	--	--	--	--
Julidochromis marlieri	DQ055039	--	510121	510120	--	--	--	--	--
Julidochromis ornatus	EF191082	--	47116853	--	--	--	--	--	--
Julidochromis regani	EF462228	134268652	393079	340559	EF470870	--	--	--	--
Julidochromis transcriptus	EF462231	--	--	--	--	--	--	--	--
Konia dikume	AJ845104	--	55468948	[1]	--	--	--	--	--
Konia eisentrauti	AJ845102	--	55468946	[1]	--	--	--	--	--
Labeotropheus fuelleborni	EF585259	--	1881622	--	--	--	--	--	--
Labeotropheus trewavasae	EF585283	--	7595685	--	--	--	--	--	--

Species									
Labidochromis caeruleus	AY740383	7576478	10046829	134303329	EF470871	–	–	–	–
Labidochromis gigas	EF585276	–	–	–	–	–	–	–	–
Labidochromis vellicans	–	–	62637911	–	–	–	–	–	–
Labrochromis ishmaeli	–	18182235	–	–	–	–	–	–	–
Lamprologus callipterus	EF462258	–	47116775	510127	–	–	–	–	–
Lamprologus congoensis	AY740385	–	510132	510128	–	–	–	–	–
Lamprologus cunningtoni	**JQ950365**	–	–	**JQ950368**	–	–	–	–	–
Lamprologus kungweensis	EF191084	–	–	–	–	–	–	–	–
Lamprologus laparogramma	EF462278	–	–	–	–	–	–	–	–
Lamprologus lemairii	EF191093	–	47116856	**JQ950369**	–	–	–	–	–
Lamprologus meleagris	EF191097	–	67553148	–	–	–	–	–	–
Lamprologus mocquardi	AF398225	–	510142	510141	–	–	–	–	–
Lamprologus ocellatus	EF191114	–	–	–	–	–	–	–	–
Lamprologus ornatipinnis	EF191110	–	–	–	–	–	–	–	–
Lamprologus savoryi	**JQ950366**	–	–	**JQ950370**	–	–	–	–	–
Lamprologus signatus	EF191086	–	–	–	–	–	–	–	–
Lamprologus speciosus	DQ055032	–	67553153	–	–	–	–	–	–
Lamprologus teugelsi	DQ055059	–	67553174	–	–	–	–	–	–
Lamprologus werneri	–	–	510144	510143	–	–	–	–	–
Lepidiolamprologus attenuatus	AY682532.1	–	55276021	**JQ950371**	–	–	–	–	–
Lepidiolamprologus cunningtoni	DQ055053	–	50916249	–	–	–	–	–	–
Lepidiolamprologus elongatus	DQ055021	18182237	67553142	510135	–	–	–	–	–
Lepidiolamprologus kendalli	DQ055042	–	67553160	–	–	–	–	–	–
Lepidiolamprologus nkambae	DQ055046	–	67553165	–	–	–	–	–	–
Lepidiolamprologus profundicola	DQ055025	–	47116841	–	–	–	–	–	–
Lepidolamprologus elongatus	EF679248	–	–	EF679280	–	–	–	–	–
Lestradea perspicax	AY337765	–	313074	313072	–	–	–	–	–
Lestradea stappersii	AY337792.1	–	33355527	33356028	–	–	–	–	–
Lethrinops altus	–	–	62637918	–	–	–	–	–	–
Lethrinops auritus	U07252	–	529341	–	–	–	–	–	–
Lethrinops furcifer	AF305316	–	22531798	–	–	–	–	–	–
Lethrinops gossei	AF305290	–	22531772	–	–	–	–	–	–
Lethrinops longipinnis	AF305295	–	22531777	–	–	–	–	–	–
Lethrinops microdon	AF305292	–	22531774	–	–	–	–	–	–
Lethrinops mylodon	–	–	62637926	–	–	–	–	–	–
Lethrinops oliveri	AF305288	–	22531770	–	–	–	–	–	–
Lethrinops polli	–	–	62637931	–	–	–	–	–	–
Limnochromis abeelei	AY682533	–	55276022	–	–	–	–	–	–
Limnochromis auritus	AF398216	–	313071	313069	–	–	–	–	–
Limnochromis staneri	AY682538	–	55276030	–	–	–	–	–	–
Limnotilapia dardennii	DQ093109	–	34495299	38202268	–	–	–	–	–
Lipochromis cryptodon	**JQ950390**	–	–	–	–	–	–	–	–
Lipochromis maxillaris	–	–	60550087	–	–	–	–	–	–
Lipochromis melanopterus	–	–	7595589	–	–	–	–	–	–
Lipochromis obesus	–	–	529342	–	–	–	–	–	–
Lipochromis sp. "velvet cryptodon"	**JQ950391**	–	–	–	–	–	–	–	–
Lobochilotes labiatus	EF679250	–	393083	18265844	–	–	–	–	–
Maravichromis mola	EF585274	–	–	–	–	–	–	–	–
Maylandia callainos	EF585271	–	7595682	–	–	–	–	–	–
Maylandia estherae	–	18182238	–	–	–	–	–	–	–
Maylandia zebra	DQ093114.1	33090452	60550078	–	EF470875	–	–	–	–
Mchenga eucinostomus	EF585268	–	–	–	–	–	–	–	–
Melanochromis auratus	AY930069.1	–	403987	–	–	–	–	–	–
Melanochromis elastodema	–	–	62637935	–	–	–	–	–	–
Melanochromis heterochromis	–	–	403997	–	–	–	–	–	–
Melanochromis johannii	–	–	404001	–	–	–	–	–	–
Melanochromis melanopterus	–	–	404005	–	–	–	–	–	–
Melanochromis parallelus	–	–	404006	–	–	–	–	–	–
Melanochromis simulans	–	–	404003	–	–	–	–	–	–
Melanochromis vermivorus	EF585270	–	–	–	–	–	–	–	–
Metriaclima zebra	–	–	–	134303335	–	–	–	–	–
Microdontochromis rotundiventralis	AY337793.1	–	33355551	33356100	–	–	–	–	–
Microdontochromis tenuidentatus	AY337784.1	–	33355549	313075	–	–	–	–	–
Myaka myaka	AJ845106	–	55468950	1	–	–	–	–	–
Mylochromis anaphyrmus	AF305321	–	22531803	–	–	–	–	–	–
Mylochromis ericotaenia	–	–	62637938	–	–	–	–	–	–
Mylochromis labidodon	–	–	13235351	–	–	–	–	–	–
Mylochromis lateristriga	–	–	7595686	–	–	–	–	–	–
Nanochromis parilus	–	GQ168003	–	–	GQ168191	GQ168317	GQ168065	GQ168128	GQ168254
Neochromis rufocaudalis	–	18182245	7595607	–	–	–	–	–	–
Neolamprologus bifasciatus	EF462240	–	–	–	–	–	–	–	–
Neolamprologus boulengeri	–	–	67553155	–	–	–	–	–	–
Neolamprologus brevis	DQ055020	–	510159	–	–	–	–	–	–
Neolamprologus brichardi	EF462245	33090455	510161	510158	–	–	–	–	–
Neolamprologus buescheri	DQ055033	–	67553154	–	–	–	–	–	–
Neolamprologus calliurus	EF191083	–	510163	–	–	–	–	–	–
Neolamprologus caudopunctatus	AY740388	–	108793969	–	–	–	–	–	–
Neolamprologus christyi	AY740389.1	–	510157	510162	–	–	–	–	–
Neolamprologus cylindricus	EF462224	–	510165	–	–	–	–	–	–
Neolamprologus devosi	EF437476.1	–	–	–	–	–	–	–	–
Neolamprologus falicula	EF462246	–	–	–	–	–	–	–	–
Neolamprologus fasciatus	EF191119	–	47116843	–	–	–	–	–	–
Neolamprologus furcifer	EF462249	–	510168	510167	–	–	–	–	–
Neolamprologus gracilis	–	–	18254012	18307833	–	–	–	–	–
Neolamprologus hecqui	DQ055041	–	67553139	–	–	–	–	–	–
Neolamprologus helianthus	DQ055013	–	18254007	18307823	–	–	–	–	–
Neolamprologus leleupi	DQ093113	–	–	–	–	–	–	–	–
Neolamprologus leloupi	EF191103.1	–	–	–	–	–	–	–	–
Neolamprologus longicaudata	EF462250	–	510171	510169	–	–	–	–	–
Neolamprologus marunguensis	AY740390.1	–	18254002	18307813	–	–	–	–	–
Neolamprologus meeli	DQ055051	–	67553169	–	–	–	–	–	–
Neolamprologus modestus	DQ055012	–	47116917	–	–	–	–	–	–
Neolamprologus mondabu	EF462241	–	47116855	**JQ950367**	–	–	–	–	–
Neolamprologus multifasciatus	EF191089	–	–	–	–	–	–	–	–
Neolamprologus mustax	EF462223	–	–	–	–	–	–	–	–

Species									
Neolamprologus niger	AY740391.1	→	→	→	→	→	→	→	→
Neolamprologus nigriventris	AY740392.1	→	→	→	→	→	→	→	→
Neolamprologus olivaceous	AY740393.1	→	18254004	18307817	→	→	→	→	→
Neolamprologus palmeri	AY740394.1	→	→	→	→	→	→	→	→
Neolamprologus pectoralis	EF462238	→	→	→	→	→	→	→	→
Neolamprologus petricola	→	→	47116831	→	→	→	→	→	→
Neolamprologus prochilus	EF462248	→	→	→	→	→	→	→	→
Neolamprologus pulcher	EF462244	→	47116778	18307839	→	→	→	→	→
Neolamprologus savoryi	EF462247	→	18254001	18307807	→	→	→	→	→
Neolamprologus similis	EF191100	→	67553151	→	→	→	→	→	→
Neolamprologus splendens	→	→	18254013	18307835	→	→	→	→	→
Neolamprologus tetracanthus	EF462220	→	50916263	→	→	→	→	→	→
Neolamprologus toae	**JQ950364**	→	510176	510175	→	→	→	→	→
Neolamprologus tretocephalus	EF462219	→	47116857	EF679285	→	→	→	→	→
Neolamprologus variostigma	DQ055028	→	67553149	→	→	→	→	→	→
Neolamprologus ventralis	EF462233	→	→	→	→	→	→	→	→
Neolamprologus wauthioni	EF191116	→	→	→	→	→	→	→	→
Nimbochromis fuscotaeniatus	→	134268656	→	134303333	EF470872	→	→	→	→
Nimbochromis linni	EF585279	→	58866395	→	→	→	→	→	→
Nimbochromis livingstonii	EU753948.1	→	62637942	→	→	→	→	→	→
Nimbochromis polystigma	EF585262	→	13235349	→	→	→	→	→	→
Nimbochromis venustus	EU753947.1	→	11602783	→	→	→	→	→	→
Ophthalmotilapia boops	AY337773.1	→	50262165	33356010	→	→	→	→	→
Ophthalmotilapia heterodonta	→	→	12830449	→	→	→	→	→	→
Ophthalmotilapia nasuta	AY337783.1	→	12830454	33356070	→	→	→	→	→
Ophthalmotilapia ventralis	AY337774.1	→	33355525	313081	→	→	→	→	→
Opthalmotilapia heterodonta	EF679254	→	→	EF679286	→	→	→	→	→
Oreochromis amphimelas	AF317230.1	→	15428675	18076051	→	→	→	→	→
Oreochromis andersonii	GQ167805	GQ167994	15428673	→	GQ168182	GQ168308	GQ168056	GQ168119	GQ168245
Oreochromis aureus	DQ465029	90018769	24635221	14161580	→	→	→	→	→
Oreochromis esculentus	AF317232.1	58199024	15428667	18076057	→	→	→	→	→
Oreochromis jipe	→	→	15428678	→	→	→	→	→	→
Oreochromis karongae	DQ465030	134268654	15429056	134303325	EF470873	→	→	→	→
Oreochromis leucostictus	AF317233.1	→	116672807	→	→	→	→	→	→
Oreochromis macrochir	AF317235.1	→	→	→	→	→	→	→	→
Oreochromis malagarasi	→	→	15428649	2394115	→	→	→	→	→
Oreochromis mortimeri	→	→	15429057	→	→	→	→	→	→
Oreochromis mossambicus	AF317234.1	33090451	15428652	4903283	→	→	→	→	→
Oreochromis mweruensis	AF317236	→	→	→	→	→	→	→	→
Oreochromis niloticus	AF317237	5114129	15429060	24635169	GQ168157	GQ168283	GQ168032	GQ168094	GQ168220
Oreochromis niloticus baringoensis	→	→	→	18076054	→	→	→	→	→
Oreochromis schwebischi	AF317238.1	→	→	→	→	→	→	→	→
Oreochromis tanganicae	AF317240	GQ167971	313080	13224	GQ168159	GQ168285	GQ168034	GQ168096	GQ168222
Oreochromis urolepis	AF317239.1	→	15428653	→	→	→	→	→	→
Oreochromis variabilis	AF317241.1	→	→	→	→	→	→	→	→
Orthochromis sp.	→	→	**JQ950406**	→	→	→	→	→	→
Orthochromis sp.	→	→	**JQ950407**	→	→	→	→	→	→
Orthochromis kasuluensis	AY930049.1	→	60549997	→	→	→	→	→	→
Orthochromis luichensis	AY930052.1	→	60550000	→	→	→	→	→	→
Orthochromis malagaraziensis	AY930054.1	→	60550002	2394145	→	→	→	→	→
Orthochromis mazimeroensis	AY930053.1	→	60550001	18265828	→	→	→	→	→
Orthochromis mosoensis	AY930055.1	→	60550003	→	→	→	→	→	→
Orthochromis polyacanthus	AF398231	→	18029959	18265822	→	→	→	→	→
Orthochromis rubrolabialis	AY930051.1	→	60549999	→	→	→	→	→	→
Orthochromis rugufuensis	AY930050.1	→	60549998	→	→	→	→	→	→
Orthochromis uvinzae	AY930048.1	→	60549996	→	→	→	→	→	→
Otopharynx argyrosoma	→	→	62637944	→	→	→	→	→	→
Otopharynx brooksi	AF305303	→	13235094	→	→	→	→	→	→
Otopharynx heterodon	EF585278	→	→	→	→	→	→	→	→
Otopharynx speciosus	AF305304	→	22531786	→	→	→	→	→	→
Otopharynx walteri	EU661716.1	→	→	→	→	→	→	→	→
Oxylapia polli	AF317275.1	AY263817	→	→	AY662832	→	→	→	→
Pallidochromis tokolosh	AF305276	→	22531758	→	→	→	→	→	→
Paracyprichromis brieni	AF398223	→	313089	313087	→	→	→	→	→
Paracyprichromis nigripinnis	AY740339.1	→	58379145	58379257	→	→	→	→	→
Paralabidochromis beadlei	→	→	7595581	→	→	→	→	→	→
Paralabidochromis chilotes	→	→	7595587	→	→	→	→	→	→
Paralabidochromis plagiodon	→	→	7595591	→	→	→	→	→	→
Paralabidochromis sp. "rockkribensis"	**JQ950392**	→	→	→	→	→	→	→	→
Paratilapia polleni	AP009508.1	AY263818	→	→	→	→	→	→	→
Paratilapia polleni Nosy Be	→	AY662719	→	→	AY662834	→	→	→	→
Paratilapia polleni Ravelobe	→	AY662720	→	→	AY662835	→	→	→	→
Paretroplus dambabe	→	AY263822	→	→	AY662819	→	→	→	→
Paretroplus kieneri	→	AY263827	→	→	AY662821	→	→	→	→
Paretroplus maculatus	AP009504.1	AY263820	→	→	AY662824	→	→	→	→
Paretroplus maromandia	→	AY263821	→	→	AY662825	→	→	→	→
Paretroplus menarambo	→	AY263823	→	→	AY662826	→	→	→	→
Paretroplus nourissati	→	AY263828	→	→	AY662827	→	→	→	→
Paretroplus polyactis	→	AF112582	→	→	U70327	→	→	→	→
Paretroplus polyactis North	→	AY662718	→	→	AY662831	→	→	→	→
Paretroplus polyactis South	→	AY263826	→	→	AY662828	→	→	→	→
Paretroplus tsimoly	→	AY662716	→	→	AY662829	→	→	→	→
Pelmatochromis buettikoferi	GQ167783	GQ167972	→	→	GQ168160	GQ168286	GQ168035	GQ168097	GQ168223
Pelmatochromis nigrofasciatus	→	58199025	→	→	AY662870	GQ168287	GQ168036	GQ168098	GQ168224
Pelvicachromis humilis	→	→	2394099	2394113	→	→	→	→	→
Pelvicachromis pulcher	AF317271.1	58199026	→	2394149	EF470874	→	→	→	→
Perissodus eccentricus	EF437506	→	→	→	→	→	→	→	→
Perissodus microlepis	EF437483.1	→	18029977	18265838	→	→	→	→	→
Petrochromis ephippium	→	→	47156788	38202274	→	→	→	→	→
Petrochromis famula	EF679265	→	34495303	38202276	→	→	→	→	→
Petrochromis fasciolatus	→	→	50916259	→	→	→	→	→	→
Petrochromis sp. "kazumbe"	JQ755377	→	→	JQ755408	→	→	→	→	→
Petrochromis sp. "kazumbe polyodon"	JQ755346	→	→	JQ755398	→	→	→	→	→
Petrochromis macrognathus	AY930068.1	→	50916247	→	→	→	→	→	→
Petrochromis moshi	JQ755386	→	→	JQ755411	→	→	→	→	→
Petrochromis orthognathus	JQ755362	→	393084	18265846	→	→	→	→	→

Petrochromis polyodon	JQ755357	→	50916264	JQ755399	→	→	→	→	→
Petrochromsi sp. "moshi"	EF679256	→	→	EF679288	→	→	→	→	→
Petrochromis trewavasae	→	→	47156790	38202300	→	→	→	→	→
Petrotilapia nigra	EU661721.1	→	→	→	→	→	→	→	→
Pharyngochromis acuticeps	AY930094	→	58866300	→	→	→	→	→	→
Pharyngochromis sp.	→	→	JQ950408	→	→	→	→	→	→
Pharyngochromis sp. DAJ-2005	→	→	58866322	→	→	→	→	→	→
Placidochromis cf. *subocularis* MRI-2005	→	→	62637950	→	→	→	→	→	→
Placidochromis johnstoni	EF585269	→	→	→	→	→	→	→	→
Placidochromis milomo	EF585251	→	393087	→	→	→	→	→	→
Platytaeniodus degeni	AY930064.1	18182249	48773064	→	→	→	→	→	→
Plecodus elaviae	EF437504	→	→	→	→	→	→	→	→
Plecodus multidentatus	EF437505.1	→	→	→	→	→	→	→	→
Plecodus paradoxus	EF437499	→	→	→	→	→	→	→	→
Plecodus straeleni	AF398221	→	313092	313090	→	→	→	→	→
Prognathochromis dentex	→	→	48773070	→	→	→	→	→	→
Prognathochromis longirostris	→	→	48773069	→	→	→	→	→	→
Prognathochromis paraguiarti	→	→	48773072	→	→	→	→	→	→
Prognathochromis sp. "LE"	JQ950393	→	→	→	→	→	→	→	→
Prognathochromis venator	→	→	7595599	→	→	→	→	→	→
Protomelas annectens	EU661718.1	→	13235352	→	→	→	→	→	→
Protomelas fenestratus	AF305301	→	7595687	→	→	→	→	→	→
Protomelas insignis	→	→	62637951	→	→	→	→	→	→
Protomelas similis	EU661714.1	→	→	→	→	→	→	→	→
Protomelas spilopterus	EF585253	→	→	→	→	→	→	→	→
Protomelas taeniolatus	AF305302	→	22531784	→	→	→	→	→	→
Psammochromis riponianus	→	→	7595592	→	→	→	→	→	→
Pseudocrenilabrus sp. "broad head black pelvic"	→	→	JQ950409	→	→	→	→	→	→
Pseudocrenilabrus sp. "dwarf black pelvic"	→	→	JQ950410	→	→	→	→	→	→
Pseudocrenilabrus sp. "fire tail"	→	→	JQ950411	→	→	→	→	→	→
Pseudocrenilabrus sp. "green weed picker"	→	→	JQ950412	→	→	→	→	→	→
Pseudocrenilabrus sp. "grey back"	→	→	JQ950413	→	→	→	→	→	→
Pseudocrenilabrus sp. "grey moeruensis"	→	→	JQ950414	→	→	→	→	→	→
Pseudocrenilabrus sp. "long brown"	→	→	JQ950415	→	→	→	→	→	→
Pseudocrenilabrus sp. "long grey"	→	→	JQ950416	→	→	→	→	→	→
Pseudocrenilabrus machadoi	EU753936.1	→	58866315	→	→	→	→	→	→
Pseudocrenilabrus multicolor	AY930070.1	→	18029960	18265824	→	→	→	→	→
Pseudocrenilabrus multicolor victoriae	AY930070	→	60550018	→	→	→	→	→	→
Pseudocrenilabrus nicholsi	AY602994	→	47498977	47118406	→	→	→	→	→
Pseudocrenilabrus sp. "pale deep"	→	→	JQ950417	→	→	→	→	→	→
Pseudocrenilabrus philander	AY602993.1	→	47717261	47118404	→	→	→	→	→
Pseudocrenilabrus sp. "blue Lunzua River"	EU753951.1	→	47717289	→	→	→	→	→	→
Pseudocrenilabrus sp. "orange Mwatishi River"	EU753952.1	→	47717269	→	→	→	→	→	→
Pseudocrenilabrus sp. "telmatochromis-like"	→	→	JQ950418	→	→	→	→	→	→
Pseudocrenilabrus sp. "weed picker"	→	→	JQ950419	→	→	→	→	→	→
Pseudosimochromis curvifrons	→	→	18029982	18265848	→	→	→	→	→
Pseudotropheus aurora	EF585266	→	→	→	→	→	→	→	→
Pseudotropheus barlowi	→	→	1881627	→	→	→	→	→	→
Pseudotropheus crabro	EF585256	→	→	→	→	→	→	→	→
Pseudotropheus elongatus	EF585272	→	→	→	→	→	→	→	→
Pseudotropheus lanisticola	→	→	62637956	→	→	→	→	→	→
Pseudotropheus livingstonii	AY930061.1	→	60550009	→	→	→	→	→	→
Pseudotropheus microstoma	EF585258	→	→	→	→	→	→	→	→
Pseudotropheus tropheops	AY740384.1	→	62637959	→	→	→	→	→	→
Pseudotropheus tropheops gracilior	EF585260	→	→	→	→	→	→	→	→
Pseudotropheus williamsi	→	→	1881637	→	→	→	→	→	→
Pseudotropheus xanstomachus	→	→	1881639	→	→	→	→	→	→
Pterochromis congicus	GQ167807	GQ167974	→	→	GQ168162	GQ168288	GQ168037	GQ168099	GQ168225
Ptychochromoides betsileanus	→	AY263815	→	→	AY662838	→	→	→	→
Ptychochromis grandidieri	→	AY263811	→	→	AY662841	→	→	→	→
Ptychochromoides katria	AP009507.1	→	AP009507.1	→	AY662840	→	→	→	→
Ptychochromis sp. "garaka"	→	AY662723	→	→	AY662845	→	→	→	→
Ptychochromis oligacanthus	→	AY279667	→	→	AY279770	→	→	→	→
Ptychochromis inornatus	→	AY263812	→	→	→	→	→	→	→
Ptychochromoides sp. "Makira"	→	AY662724	→	→	→	→	→	→	→
Ptychochromis sp. "sofia"	→	AY662725	→	→	AY662847	→	→	→	→
Ptychochromoides vondrozo	→	AY263816	→	→	AY662839	→	→	→	→
Ptyochromis ishmaeli	→	→	48773062	→	→	→	→	→	→
Ptyochromis sauvagei	AY930059	→	7595593	→	→	→	→	→	→
Ptyochromis xenognathus	JQ950394	→	7595594	→	→	→	→	→	→
Pungu maclareni	AJ845101.1	→	55468944	¹	→	→	→	→	→
Reganochromis calliurus	AY682544	→	55276032	→	→	→	→	→	→
Rhamphochromis esox	AF305252.1	134268657	22531734	134303331	EF470876	→	→	→	→
Rhamphochromis leptosoma	AF305253.1	→	62637967	→	→	→	→	→	→
Rhamphochromis longiceps	JQ950395	→	62637971	→	→	→	→	→	→
Rhamphochromis macrophthalmus	AF305249	→	22531731	→	→	→	→	→	→
Rhamphochromis sp. "big mouth"	AF305251.1	→	22531733	→	→	→	→	→	→
Rhamphochromis sp. "brown"	AF305247.1	→	22531729	→	→	→	→	→	→
Rhamphochromis sp. "long snout"	→	→	62637973	→	→	→	→	→	→
Rhamphochromis sp. "maldeco"	AF305254.1	→	62637975	→	→	→	→	→	→
Sargochromis sp. "big miller"	→	→	JQ950420	→	→	→	→	→	→
Sargochromis carlottae	EF393682	→	58866304	→	→	→	→	→	→
Sargochromis cf. *mellandi*	→	→	JQ950421	→	→	→	→	→	→
Sargochromis cf. *mortimeri* DAJ-2005	→	→	58866327	→	→	→	→	→	→
Sargochromis codringtonii	EF393713	→	58866306	→	→	→	→	→	→
Sargochromis sp. "compressed suborbital"	→	→	JQ950422	→	→	→	→	→	→
Sargochromis coulteri	EU753954.1	→	58866341	→	→	→	→	→	→
Sargochromis sp. "deep body yellowish"	→	→	JQ950423	→	→	→	→	→	→
Sargochromis sp. "deep short jaws"	→	→	JQ950424	→	→	→	→	→	→
Sargochromis sp. "elongate"	→	→	JQ950425	→	→	→	→	→	→
Sargochromis giardi	AY930098.1	→	58866319	→	→	→	→	→	→
Sargochromis mellandi	EF393700	→	58866348	→	→	→	→	→	→
Sargochromis mortimeri	→	→	58866342	→	→	→	→	→	→
Sargochromis sp. "red face"	→	→	JQ950426	→	→	→	→	→	→
Sargochromis sp. 1 DAJ-2005	→	→	58866324	→	→	→	→	→	→
Sargochromis sp. 2 DAJ-2005	→	→	58866340	→	→	→	→	→	→
Sargochromis sp. 3 DAJ-2005	→	→	58866325	→	→	→	→	→	→

Sargochromis sp. "kafuensis"	—	—	126015733	—	—	—	—	—	—
Sargochromis sp. "Lisikili"	—	—	**JQ950427**	—	—	—	—	—	—
Sargochromis sp. SK-2007	—	—	126015743	—	—	—	—	—	—
Sargochromis sp. "Zambesi"	—	—	AY913878.1	—	—	—	—	—	—
Sargochromis sp. "thin face green"	—	—	**JQ950428**	—	—	—	—	—	—
Sargochromis sp. "yellow face mellandi"	—	—	**JQ950429**	—	—	—	—	—	—
Sarotherodon caroli	AJ845113	—	55468956	1	—	—	—	—	—
Sarotherodon caudomarginatus	AF317243.1	GQ167975	—	—	GQ168163	GQ168289	GQ168038	GQ168100	GQ168226
Sarotherodon galilaeus	AF317244	—	15429064	14161582	—	—	—	—	—
Sarotherodon galilaeus Cross	—	—	1	1	—	—	—	—	—
Sarotherodon galilaeus Ejagham	—	—	1	1	—	—	—	—	—
Sarotherodon galilaeus Meme	—	—	1	1	—	—	—	—	—
Sarotherodon galilaeus multifasciatus	AJ845087.1	—	55468930	—	—	—	—	—	—
Sarotherodon galilaeus sanagaensis	AJ845085.1	—	55468929	1	—	—	—	—	—
Sarotherodon linnellii	AJ845114	—	55468958	1	—	—	—	—	—
Sarotherodon lohbergeri	AJ845108	—	55468952	—	—	—	—	—	—
Sarotherodon melanotheron	AF317245.1	GQ167976	19569083	14134134	—	—	—	—	—
Sarotherodon mvogoi	GQ167811	GQ168000	—	—	GQ168188	GQ168314	GQ168062	GQ168125	GQ168251
Sarotherodon nigripinnis	AJ845084.1	—	19568978	—	GQ168164	GQ168290	GQ168039	GQ168101	GQ168227
Sarotherodon occidentalis	AF317246.1	—	—	—	—	—	—	—	—
Sarotherodon sp. aff. *galilaeus* "mudfeeder"	—	GQ167977	—	—	GQ168165	GQ168291	GQ168040	GQ168102	GQ168228
Sarotherodon sp. "bighead"	AJ845091.1	—	55468935	—	—	—	—	—	—
Sarotherodon sp. "mudfeeder"	AJ845092.1	—	55468936	—	—	—	—	—	—
Sarotherodon steinbachi	AJ845110	18182244	55468954	1	—	—	—	—	—
Schwetzochromis neodon	EU753957.1	—	—	—	—	—	—	—	—
Schwetzochromis stormsi	AY930057	—	60550005	—	—	—	—	—	—
Sciaenochromis benthicola	AF305298	—	22531780	—	—	—	—	—	—
Sciaenochromis gracilis	—	—	13235350	—	—	—	—	—	—
Sciaenochromis psammophilus	AF305324	—	22531806	—	—	—	—	—	—
Sciaenochromis spilostichus	—	—	62637940	—	—	—	—	—	—
Serranochromis altus	EF393697.1	—	58866372	—	—	—	—	—	—
Serranochromis angusticeps	EF393685	—	58866380	—	—	—	—	—	—
Serranochromis angusticeps yellow	—	—	**JQ950430**	—	—	—	—	—	—
Serranochromis cf. altus	—	—	**JQ950431**	—	—	—	—	—	—
Serranochromis cf. macrocephalus	—	—	**JQ950432**	—	—	—	—	—	—
Serranochromis sp. "checkerboard"	—	—	**JQ950433**	—	—	—	—	—	—
Serranochromis sp. "dark long body"	—	—	**JQ950434**	—	—	—	—	—	—
Serranochromis sp. "deep red"	—	—	**JQ950435**	—	—	—	—	—	—
Serranochromis sp. "diplotaxodon face"	—	—	**JQ950436**	—	—	—	—	—	—
Serranochromis longimanus	—	—	126015680	—	—	—	—	—	—
Serranochromis sp. "long body"	—	—	**JQ950437**	—	—	—	—	—	—
Serranochromis sp. "long face blue"	—	—	**JQ950438**	—	—	—	—	—	—
Serranochromis sp. "long pelvic"	—	—	**JQ950439**	—	—	—	—	—	—
Serranochromis macrocephalus	EF393689	—	58866317	1	—	—	—	—	—
Serranochromis macrocephalus "deep body"	—	—	**JQ950440**	—	—	—	—	—	—
Serranochromis meridianus	—	—	58866343	—	—	—	—	—	—
Serranochromis robustus	EF393686	5114131	126015708	—	—	—	—	—	—
Serranochromis sp. "silver long body"	—	—	**JQ950441**	—	—	—	—	—	—
Serranochromis stappersi	EF393698	—	58866385	—	—	—	—	—	—
Serranochromis thumbergi	EF393703	—	58866298	—	—	—	—	—	—
Simochromis babaulti	DQ093110	—	1110522	13504	—	—	—	—	—
Simochromis diagramma	AY930087.1	—	1055357	38202310	—	—	—	—	—
Simochromis marginatus	AY930088.1	—	1245389	JQ755414	—	—	—	—	—
Spathodus erythrodon	AF317267.1	—	1617160	5918217	—	—	—	—	—
Spathodus marlieri	EF679260	—	1617164	5918215	—	—	—	—	—
Steatocranus bleheri	GQ167789	GQ167978	—	—	GQ168166	GQ168292	GQ168041	GQ168103	GQ168229
Steatocranus casuarius	AF317247.1	GQ167979	—	2394147	GQ168167	GQ168293	GQ168042	GQ168104	GQ168230
Steatocranus gibbiceps	—	GQ167980	—	—	GQ168168	GQ168294	GQ168043	GQ168105	GQ168231
Steatocranus glaber	—	GQ168005	—	—	GQ168193	GQ168319	GQ168067	GQ168130	GQ168256
Steatocranus irvinei	GQ167792	GQ167981	—	—	GQ168169	GQ168295	GQ168044	GQ168106	GQ168232
Steatocranus sp. "bulky head"	GQ167793	GQ167982	—	—	GQ168170	GQ168296	GQ168045	GQ168107	GQ168233
Steatocranus sp. "dwarf"	—	GQ167983	—	—	GQ168171	GQ168297	GQ168046	GQ168108	GQ168234
Steatocranus sp. "redeye"	GQ167808	GQ167997	—	—	GQ168185	GQ168311	GQ168059	GQ168122	GQ168248
Steatocranus tinanti	AF317248.1	58199027	—	—	GQ168172	GQ168298	GQ168047	GQ168109	GQ168235
Steatocranus ubanguiensis	—	GQ168014	—	—	GQ168203	GQ168329	GQ168077	GQ168140	GQ168266
Stigmatochromis modestus	—	—	62637982	—	—	—	—	—	—
Stigmatochromis woodi	AF305299	—	7595688	—	—	—	—	—	—
Stomatepia mariae	AF317279	18182242	55468940	1	GQ168173	GQ168299	GQ168048	GQ168110	GQ168236
Stomatepia mongo	AJ845094	—	55468938	1	—	—	—	—	—
Stomatepia pindu	AJ845098	18182243	55468942	1	—	—	—	—	—
Taeniochromis holotaenia	—	—	62637987	—	—	—	—	—	—
Taeniolethrinops furcicauda	EF585263	—	62637984	—	—	—	—	—	—
Taeniolethrinops laticeps	AF305305	—	22531787	—	—	—	—	—	—
Taeniolethrinops praeorbitalis	AF305318	—	22531800	—	—	—	—	—	—
Tanganicodus irsacae	AF398219	—	1617161	313093	—	—	—	—	—
Telmatochromis bifrenatus	DQ055009	—	510217	510215	—	—	—	—	—
Telmatochromis brichardi	EF462236	—	—	—	—	—	—	—	—
Telmatochromis burgeoni	—	—	510218	510216	—	—	—	—	—
Telmatochromis dhonti	EF679266	—	47116792	EF679298	—	—	—	—	—
Telmatochromis sp.	—	18182240	—	—	—	—	—	—	—
Telmatochromis temporalis	EF462234	—	47116796	EF679293	—	—	—	—	—
Telmatochromis vittatus	AY740396	—	510222	510221	—	—	—	—	—
Telotrematocara macrostoma	—	—	52221317	52221274	—	—	—	—	—
Thoracochromis albolabris	EU753929.1	—	58866301	—	—	—	—	—	—
Thoracochromis avium	**JQ950396**	—	—	—	—	—	—	—	—
Thoracochromis brauschi	AY930080	GQ168007	30143258	—	GQ168195	GQ168321	GQ168069	GQ168132	GQ168258
Thoracochromis buysi	EU753933.1	—	58866305	—	—	—	—	—	—
Thoracochromis demeusii	—	—	58866311	—	—	—	—	—	—
Thoracochromis mahagiensis	**JQ950397**	—	—	—	—	—	—	—	—
Thoracochromis moeruensis black	—	—	**JQ950442**	—	—	—	—	—	—
Thoracochromis moeruensis yellow	—	—	**JQ950443**	—	—	—	—	—	—
Thoracochromis oligacanthus	AF416779.1	—	—	—	—	—	—	—	—
Thoracochromis petronius	**JQ950398**	—	—	—	—	—	—	—	—
Thoracochromis pharyngalis	**JQ950399**	—	**JQ950404**	—	—	—	—	—	—
Thoracochromis sp. "pundamilia-like"	—	—	**JQ950444**	—	—	—	—	—	—
Thoracochromis sp. "red spotted fin"	—	—	**JQ950445**	—	—	—	—	—	—
Thoracochromis rudolfianus	EU753942.1	—	—	—	—	—	—	—	—

Species									
Thoracochromis wingatii	**JQ950400**	—	—	—	—	—	—	—	—
Thysochromis ansorgii	AY663713.1	—	—	—	—	—	—	—	—
Tilapia ap. aff. rheophila Samou	—	GQ168013	—	—	GQ168202	GQ168328	GQ168076	GQ168139	GQ168265
Tilapia bakossi			[1]	[1]					
Tilapia bemini			15428684	[1]					
Tilapia bilineata Lefini	GQ167775	GQ167964	—	—	GQ168152	GQ168278	GQ168027	GQ168089	GQ168215
Tilapia bilineata Salonga	—	GQ168012	—	—	GQ168201	GQ168327	GQ168075	GQ168138	GQ168264
Tilapia brevimanus	AF317249.1	GQ168016	—	[1]	GQ168205	GQ168331	GQ168079	GQ168142	GQ168268
Tilapia busumana	AF317250.1	GQ167987	—	[1]	GQ168175	GQ168301	GQ168049	GQ168112	GQ168238
Tilapia buttikoferi	AF317251.1	GQ167986	—	—	GQ168174	GQ168300	—	GQ168111	GQ168237
Tilapia cabrae	AF317252.1	—	—	—	—	—	—	—	—
Tilapia cessiana	AF317253.1	—	—	—	—	—	—	—	—
Tilapia cf. nyongana Dja	—	GQ168015	—	—	GQ168204	GQ168330	GQ168078	GQ168141	GQ168267
Tilapia cf. rheophila	GQ167825	—	—	—	—	—	—	—	—
Tilapia coffea	AF317254.1	—	—	—	—	—	—	—	—
Tilapia dageti	GQ167821	GQ168010	—	—	GQ168198	GQ168324	GQ168072	GQ168135	GQ168261
Tilapia deckerti Eja	—	—	[1]	[1]	—	—	—	—	—
Tilapia discolor	AF317255.1	GQ167990	15428686	—	GQ168178	GQ168304	GQ168052	GQ168115	GQ168241
Tilapia Eja Jewel			[1]	[1]					
Tilapia Eja large	—	—	[1]	[1]	—	—	—	—	—
Tilapia Eja littleone	—	—	[1]	[1]	—	—	—	—	—
Tilapia flava	—	—	[1]	[1]	—	—	—	—	—
Tilapia guineensis Cross	—	—	[1]	[1]	—	—	—	—	—
Tilapia guineensis Ivoire	—	—	[1]	[1]	—	—	—	—	—
Tilapia guineensis Nguti	—	—	—	[1]	—	—	—	—	—
Tilapia guinasana	GQ167802	GQ167991	—	—	GQ168179	GQ168305	GQ168053	GQ168116	GQ168242
Tilapia guineensis	AF317256.1	GQ168025	15428685	—	GQ168214	GQ168340	GQ168088	GQ168151	GQ168277
Tilapia gutturosa	—	—	[1]	[1]	—	—	—	—	—
Tilapia imbriferna	—	—	[1]	[1]	—	—	—	—	—
Tilapia joka	GQ167803	GQ167992	—	—	GQ168180	GQ168306	GQ168054	GQ168117	GQ168243
Tilapia kottae	—	—	[1]	[1]	—	—	—	—	—
Tilapia louka	AF317257.1	GQ168011	—	—	GQ168199	GQ168325	GQ168073	GQ168136	GQ168262
Tilapia mariae	AF317258.1	GQ168026	15428683	[1]	GQ168200	GQ168326	GQ168074	GQ168137	GQ168263
Tilapia rendalli	AF317259.1	—	15428689	2394117	—	—	—	—	—
Tilapia ruweti	GQ167799	GQ167988	15428692	—	GQ168176	GQ168302	GQ168050	GQ168113	GQ168239
Tilapia snyderae	—	—	—	[1]	—	—	—	—	—
Tilapia sp. aff. zillii Kisangani	—	GQ168017	—	—	GQ168206	GQ168332	GQ168080	GQ168143	GQ168269
Tilapia sparrmanii	AF317260.1	134268651	15428693	134303319	EF470877	GQ168303	GQ168051	GQ168114	GQ168240
Tilapia tholloni	GQ167804	GQ167993	—	—	GQ168181	GQ168307	GQ168055	GQ168118	GQ168244
Tilapia walteri	AF317261.1	—	—	—	—	—	—	—	—
Tilapia zillii	AF317262.1	GQ168024	15428690	[1]	GQ168213	GQ168339	GQ168087	GQ168150	GQ168276
Tramitichromis brevis	AF305320	—	22551802	—	—	—	—	—	—
Tramitichromis intermedius	—	—	62637992	—	—	—	—	—	—
Tramitichromis lituris	—	—	13235348	—	—	—	—	—	—
Tramitichromis variabilis	AF305319	—	22551801	—	—	—	—	—	—
Trematocara macrostoma	AY663715.1	—	—	—	—	—	—	—	—
Trematocranus placodon	EF585261	—	62637990	—	—	—	—	—	—
Trematocara unimaculatum	AF317268.1	—	52221316	18265840	—	—	—	—	—
Triglachromis otostigma	AF398217	—	510220	510219	—	—	—	—	—
Tristramella simonis	AF317276.1	GQ168002	—	—	GQ168190	GQ168316	GQ168064	GQ168127	GQ168253
Tropheus annectens	—	—	13736	64099	—	—	—	—	—
Tropheus brichardi	AY930086.1	—	13746	13742	—	—	—	—	—
Tropheus duboisi	AY930085.1	134268655	13757	13751	EF470878	—	—	—	—
Tropheus sp. "kasabae"	—	—	13779	13775	—	—	—	—	—
Tropheus moorii	**JQ950401**	7576475	1495721	13781	—	—	—	—	—
Tropheus polli	AY930084.1	—	13865	13852	—	—	—	—	—
Tylochromis bangwelensis	—	—	112735228	—	—	—	—	—	—
Tylochromis cf. variabilis MK-2006	—	—	112735226	—	—	—	—	—	—
Tylochromis lateralis	—	—	112735227	—	—	—	—	—	—
Tylochromis leonensis	AF317274.1	33090449	—	—	—	—	—	—	—
Tylochromis mylodon	—	—	112735229	—	—	—	—	—	—
Tylochromis polylepis	AB018973.2	5114133	112735238	18265850	U70337	—	—	—	—
Tylochromis pulcher	—	58199028	—	—	—	—	—	—	—
Tylochromis sp.	—	—	—	—	GQ168186	GQ168312	GQ168060	GQ168123	GQ168249
Tyrannochromis nigriventer	AF305307	—	22551789	—	—	—	—	—	—
Variabilichromis moorii	DQ055016	18182236	85681972	510172	GQ168187	GQ168313	GQ168061	GQ168124	GQ168250
Xenochromis hecqui	EF437514.1	—	—	—	—	—	—	—	—
Xenotilapia bathyphila	AY337789.1	—	33355557	33356090	—	—	—	—	—
Xenotilapia boulengeri	—	—	33355559	33356050	—	—	—	—	—
Xenotilapia caudafasciata	AY337777.1	—	33355565	33356034	—	—	—	—	—
Xenotilapia flavipinnis	AY337794.1	—	33355560	33356026	—	—	—	—	—
Xenotilapia longispinis	AY337778.1	—	33355567	33356038	—	—	—	—	—
Xenotilapia melanogenys	AY682517.1	—	—	—	—	—	—	—	—
Xenotilapia ochrogenys	AY337767.1	—	313101	313099	—	—	—	—	—
Xenotilapia ornatipinnis	—	18182241	—	—	—	—	—	—	—
Xenotilapia papilio	AY337776.1	—	—	—	—	—	—	—	—
Xenotilapia sima	AY337785.1	—	18029953	33356008	—	—	—	—	—
Xenotilapia sp. "papilio sunflower"	—	—	33355574	33356022	—	—	—	—	—
Xenotilapia spiloptera	AY337788.1	—	33355570	33356032	—	—	—	—	—
Xystichromis phytophagus	AY930076.1	—	51320047	—	—	—	—	—	—
Yssichromis laparogramma	**JQ950402**	—	7595582	—	—	—	—	—	—
Yssichromis pyrrhocephalus	**JQ950403**	18182246	AB439318	—	—	—	—	—	—
Lake Saka species 1 (A870MPC18)	**JQ950372**	—	—	—	—	—	—	—	—
Lake Saka Species 2 (A994MPK8)	**JQ950373**	—	—	—	—	—	—	—	—
Cymatogaster aggregata (outgroup)	AP009128.1	AY662711	—	AF370623	AY662811	—	—	—	—
Embiotoca jacksoni (outgroup)	—	AY662712	—	AF159331	AY662812	—	—	—	—

[1] Sequence from Schliewen UK, Tautz D, Paabo S (1994) Sympatric Speciation Suggested By Monophyly Of Crater Lake Cichlids. *Nature* **368**, 629-632.

Supplementary Table 2| Correlation between binary predictor variables, measured as r^2_L, the likelihood- based equivalent of r^2 for binary variables. Mouthbrooding and polygamous mating systems are significantly correlated.

	predators	polygamy	eggspots	haplo eggspots	sexual dichromatism	mouthbrooding
predators		0.106	0.016	0.022	0.054	0.063
polygamy	-		0.271	0.185	0.409	**0.823**
eggspots	-	+		0.560	0.261	0.215
haplo eggspots	-	+	+		0.165	0.164
sexual dichromatism	-	+	+	+		0.297

Supplementary Table 3| Single predictor variable phylogenetic logistic regression reveals significant associations between cichlid diversification and lake depth, predators, mouthbrooding, sexual dichromatism, time for diversification, and lake age. When Lake Tanganyika is excluded the same variables are significant, and additionally there is are significant associations between diversification and lake surface area, latitude and egg spots. N = sample size. a = phylogenetic signal estimated for the regression.

Predictor		Full Dataset					Excluding Tanganyika					
Environmental Variables	N	Estimate	SE (±)	z-value	z-value p	a	N	Estimate	SE (±)	z-value	z-value p	a
Lake Surface Area	166	-0.062	0.043	-1.436	0.075	-2.365	150	-0.136	0.059	-2.329	**0.010**	-2.491
Lake Depth	156	0.342	0.090	3.794	**0.000**	-2.615	140	0.317	0.120	2.641	**0.004**	-2.956
Energy	166	0.010	0.009	1.080	0.140	-3.324	150	0.008	0.010	0.830	0.203	-3.520
Latitude	166	-0.043	0.027	-1.610	0.054	-3.396	150	-0.052	0.031	-1.670	**0.047**	-4.000
Latitude (residual)	166	-0.021	0.037	-0.575	0.283	-3.286	150	-0.032	0.041	-0.774	0.220	-3.362
Elevation	166	0.000	0.000	0.767	0.222	-3.457	150	0.000	0.000	0.640	0.261	-3.613
Predators	158	-0.532	0.311	-1.708	**0.044**	-2.719	142	-0.921	0.400	-2.304	**0.011**	-2.860
Traits												
Polygamous Mating System	161	0.472	0.494	0.957	0.169	-3.200	148	0.973	0.611	1.592	0.056	-3.178
Mouthbrooding	166	1.158	0.554	2.091	**0.018**	-2.905	151	0.937	0.605	1.549	0.061	-3.207
Egg spots	166	0.349	0.443	0.786	0.216	-3.368	151	0.858	0.457	1.877	**0.030**	-4.000
Haplochromine egg spots	166	0.327	0.452	0.722	0.235	-3.456	151	1.071	0.461	2.325	**0.010**	-4.000
Sexual Dichromatism	161	0.744	0.427	1.744	**0.041**	-2.656	147	1.284	0.520	2.468	**0.007**	-2.937
Time												
Time for Diversification	126	0.366	0.093	3.952	**0.000**	-2.848	112	0.462	0.176	2.629	**0.004**	-2.669
Lake Age	133	0.258	0.077	3.375	**0.000**	-2.937	117	0.249	0.113	2.197	**0.014**	-2.895

Supplementary Table 4| For radiations of five or more species, single predictor variable phylogenetic logistic regression reveals significant associations between radiation and lake depth, energy, latitude, mouthbrooding, time for diversification, and lake age. When Lake Tanganyika is excluded lake depth, egg spots, haplochromine egg spots, sexual dichromatism, time for diversification and lake age are significantly associated with radiation. N = sample size. a = phylogenetic signal estimated for the regression.

| Predictor		Full Dataset					Excluding Tanganyika					
Environmental Variables	N	Estimate	SE (±)	z-value	z-value p	a	N	Estimate	SE (±)	z-value	z-value p	a
Lake Surface Area	166	0.088	0.054	1.642	0.050	-1.902	150	0.005	0.055	0.091	0.464	-2.699
Lake Depth	156	0.471	0.115	4.095	**0.000**	-2.451	140	0.363	0.153	2.367	**0.009**	-2.679
Energy	166	0.018	0.011	1.666	**0.048**	-2.477	150	0.014	0.014	1.070	0.142	-2.880
Latitude	166	-0.054	0.031	-1.738	**0.041**	-2.149	150	-0.052	0.041	-1.256	0.105	-2.786
Latitude (residual)	166	0.005	0.028	0.172	0.432	-2.065	150	0.004	0.044	0.092	0.463	-2.713
Elevation	166	0.001	0.000	1.355	0.088	-2.473	150	0.001	0.001	1.240	0.107	-2.813
Predators	158	-0.033	0.239	-0.139	0.445	-2.026	142	-0.524	0.459	-1.142	0.127	-2.697
Traits												
Polygamous Mating System	161	0.305	0.655	0.466	0.321	-2.150	148	0.975	0.851	1.146	0.126	-2.587
Mouthbrooding	166	1.923	0.905	2.125	**0.017**	-1.052	151	0.833	0.845	0.986	0.162	-2.645
Egg spots	166	0.428	0.780	0.548	0.292	-1.401	151	1.374	0.757	1.814	**0.035**	-2.667
Haplochromine egg spots	166	-0.759	0.936	-0.811	0.209	-1.414	151	1.456	0.694	2.097	**0.018**	-2.914
Sexual Dichromatism	161	0.187	0.432	0.433	0.332	-1.914	147	1.310	0.679	1.929	**0.027**	-2.537
Time												
Time for Diversification	126	0.440	0.102	4.297	**0.000**	-2.488	112	0.521	0.197	2.647	**0.004**	-2.642
Lake Age	133	0.299	0.084	3.552	**0.000**	-2.429	117	0.235	0.124	1.897	**0.029**	-2.615

Supplementary Table 5| Full results for multiple regression models for diversification threshold 1. For summarized results, see Figure 2 in main text. Variables with relative importance scores of 0.6 or higher were included in the reduced phylogenetic logistic regression model.

Predictor	Full Dataset							Excluding Lake Tanganyika						
	nonphylogenetic			phylogenetic				nonphylogenetic			phylogenetic			
	Relative-importance value	Estimate	± SE	Estimate	±SE	Wald Z		Relative-importance value	Estimate	± SE	Estimate	±SE	Wald Z	
Lake Surface Area	**0.998**	-0.390	0.109	-0.254	0.076	**-3.351**	**0.000**	**0.999**	-0.442	0.120	-0.358	0.098	**-3.639**	**0.000**
Lake Depth	**1.000**	0.776	0.173	0.521	0.125	**4.177**	**0.000**	**0.994**	0.667	0.206	0.376	0.160	**2.356**	**0.009**
Energy	**0.913**	0.049	0.020	0.008	0.012	0.674	0.250	**0.969**	0.065	0.023	0.061	0.023	**2.728**	**0.003**
Residual Latitude	0.477	-0.051	0.034					0.484	-0.056	0.037				
Elevation	**0.692**	-0.001	0.001	-0.001	0.001	-1.256	0.105	**0.877**	-0.002	0.001	-0.001	0.001	-1.886	0.030
Predators	0.517	0.569	0.365					0.361	0.344	0.304				
Polygamous Mating System	0.254	-0.105	0.199					0.252	0.159	0.265				
Egg dummies	0.504	-0.733	0.481					0.574	-1.126	0.713				
Haplo egg dummies	**0.755**	1.335	0.620	-0.924	0.806	-1.146	0.126	**0.900**	2.168	0.905	0.343	0.697	0.493	0.311
Sexual Dichromatism	**0.977**	2.070	0.685	1.291	0.566	**2.282**	**0.011**	**0.977**	2.631	0.879	2.437	0.805	**3.029**	**0.001**

Supplementary Table 6| Full results for multiple regression models for diversification threshold 5. For summarized results, see Figure 2 in main text. Variables with relative importance scores of 0.6 or higher were included in the reduced phylogenetic logistic regression model.

| Predictor	Full Dataset							Excluding Lake Tanganyika						
	nonphylogenetic			phylogenetic				nonphylogenetic			phylogenetic			
	Relative-importance value	Estimate	± SE	Estimate	±SE	Wald Z		Relative-importance value	Estimate	± SE	Estimate	±SE	Wald Z	
Lake Surface Area	0.484	-0.089	0.057					0.483	-0.095	0.061				
Lake Depth	**1.000**	0.636	0.170	0.460	0.125	**3.691**	**0.000**	**0.610**	0.243	0.137	0.221	0.172	1.289	0.099
Energy	**0.748**	0.040	0.021	0.028	0.020	1.416	0.078	**0.860**	0.060	0.026	0.041	0.024	**1.718**	**0.043**
Residual Latitude	0.265	-0.007	0.023					0.263	-0.007	0.025				
Elevation	0.328	-0.000	0.000					**0.606**	-0.001	0.001	-0.002	0.001	-1.691	0.045
Predators	0.339	0.205	0.223					0.333	-0.201	0.265				
Polygamous Mating System	0.358	-0.324	0.338					0.277	0.114	0.409				
Egg dummies	0.324	0.119	0.268					0.333	0.244	0.388				
Haplo egg dummies	0.629	0.821	0.461	0.649	0.627	1.037	0.150	**0.824**	1.666	0.743	1.493	0.761	**1.961**	**0.025**
Sexual Dichromatism	**0.708**	1.049	0.536	0.919	0.594	1.546	0.061	**0.708**	1.421	0.764	2.158	0.975	**2.213**	**0.013**

SUPPLEMENTARY FIGURES
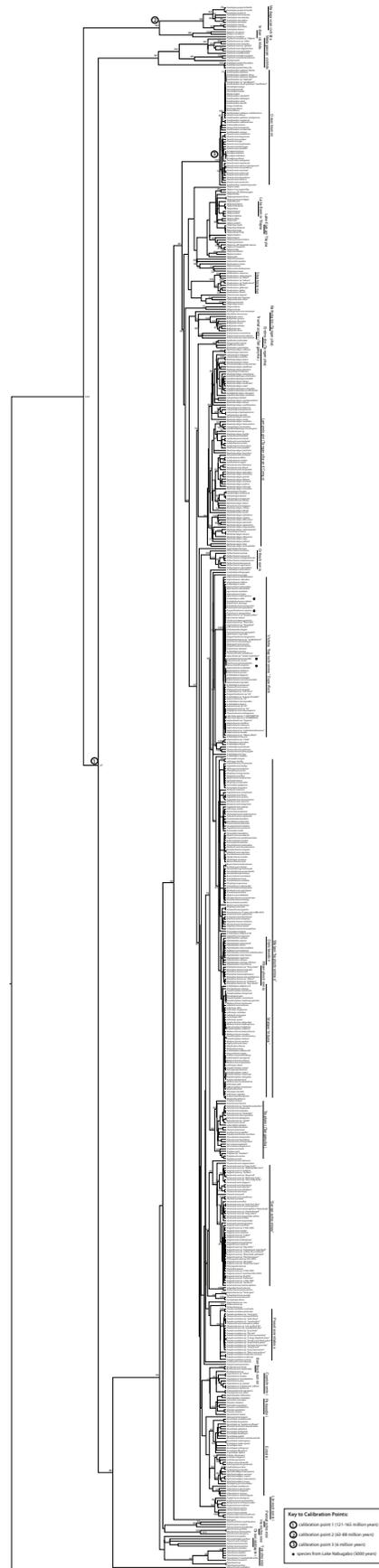
Supplementary Figure 1| Phylogeny of African cichlid fishes. The topology here is the best maximum likelihood topology from a full RAxML search.
Numbers on nodes are bootstrap values from 100 rounds of bootstrapping.

Supplementary Figure 2| Phylogenetic relationships and diversification in lacustrine African cichlids. a Phylogenetic relationships among African cichlid lineages present in lakes. This is the full tree shown in Supplementary Figure 1 trimmed to represent all lineages in lakes present in our dataset. Bars on nodes represent 95% confidence intervals drawn from the distribution of branching times among ultrametric bootstrap replicate trees. **b** The distribution of lake colonizations and intralacustrine diversification across the African cichlid phylogeny. This panel corresponds with Figure 1a and is included here to facilitate translation between that figure and the taxa included in the tree. Here, as in Figure 1a, each tip represents one lineage in a lake (lake names are shown); red dots indicate diversifying lineages (lineages with at least one intralacustrine speciation event).
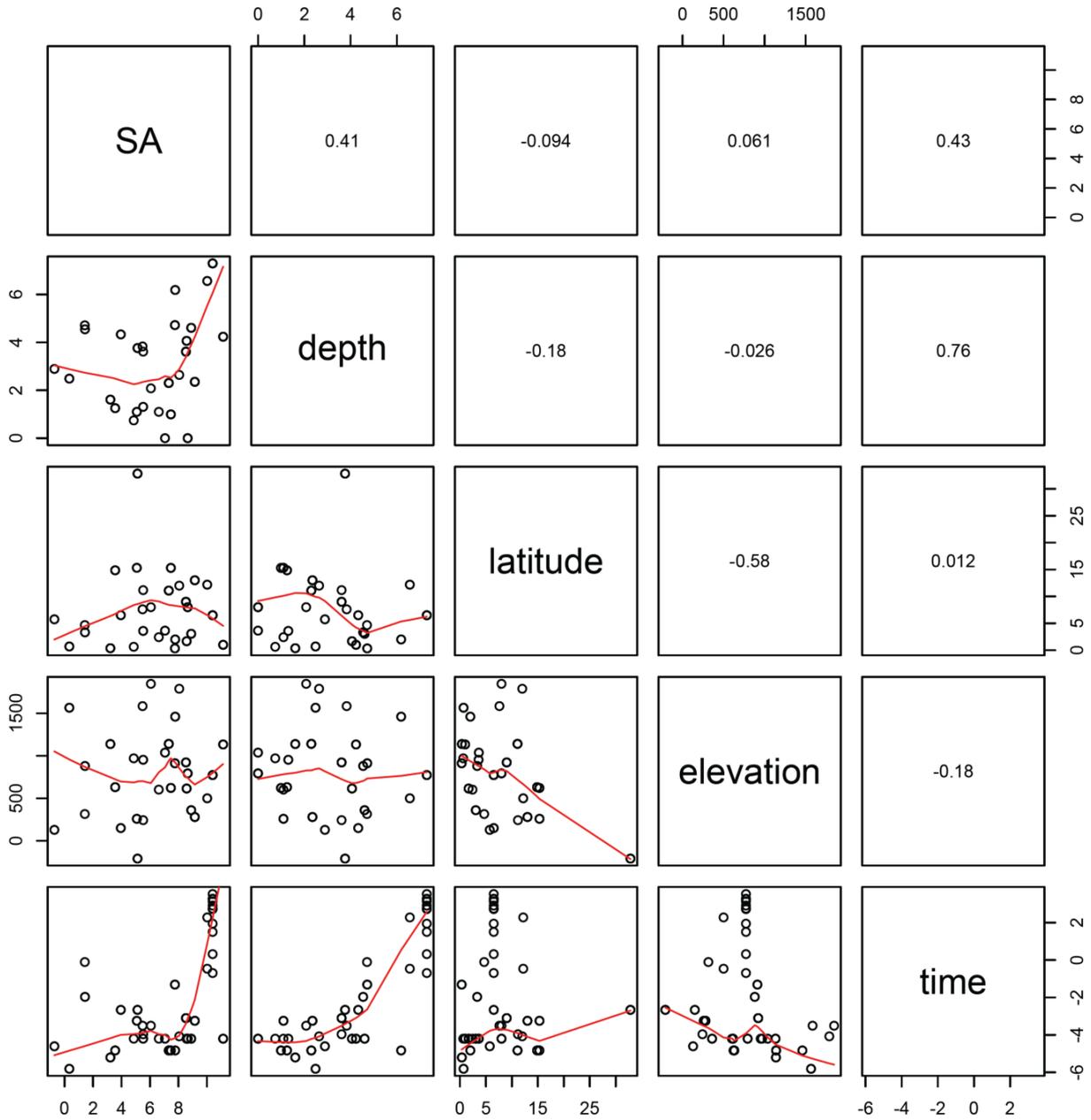
Supplementary Figure 3| Correlation between continuous predictor variables. There is strong correlation between lake depth and time for diversification (r2 = 0.77) and between energy and latitude (r2 = -0.82). Red lines in panels on the lower triangle are lowess fits.
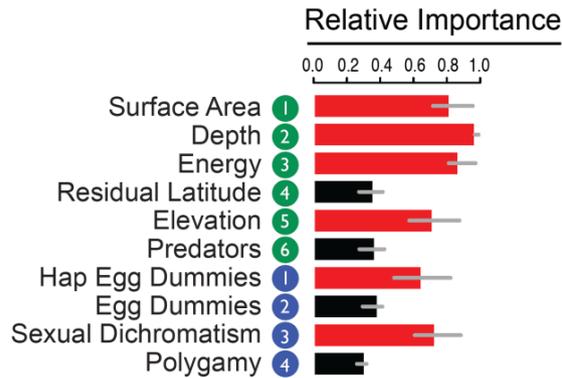
Supplementary Figure 4| Relative importance values derived from a cross-validation test, wherein the model averaging procedure was applied to random subsets of 75% of the total dataset. Results indicate high importance values for the same subset of predictors as in the full dataset (compare to Figure 2a). Gray bars represent 25% and 75% confidence intervals.
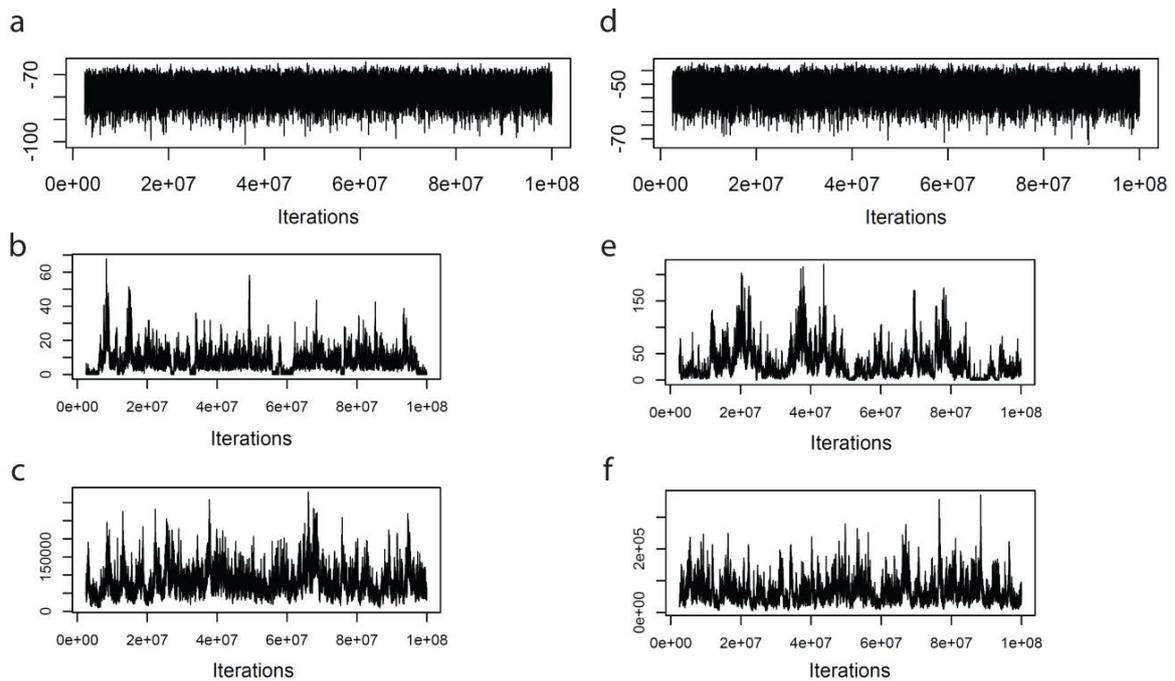
Supplementary Figure 5| Convergence diagnostic plots for MCMCglmm analyses from two example runs. Panels a, b and c are from one of 100 replicate analyses of the full dataset; panels d, e and f are from one of 100 replicate analyses of the dataset excluding lineages from Lake Tanganyika. Panels a and d: deviance/-2 plotted over the course of the run. Panels b and e: trace of the "animal" variable, which represents the inferred influence of phylogeny, over the course of the run for the poisson portion of the hurdle regression. Panels c and f: trace of the "animal" variable over the course of the run for the binary portion of the hurdle regression.
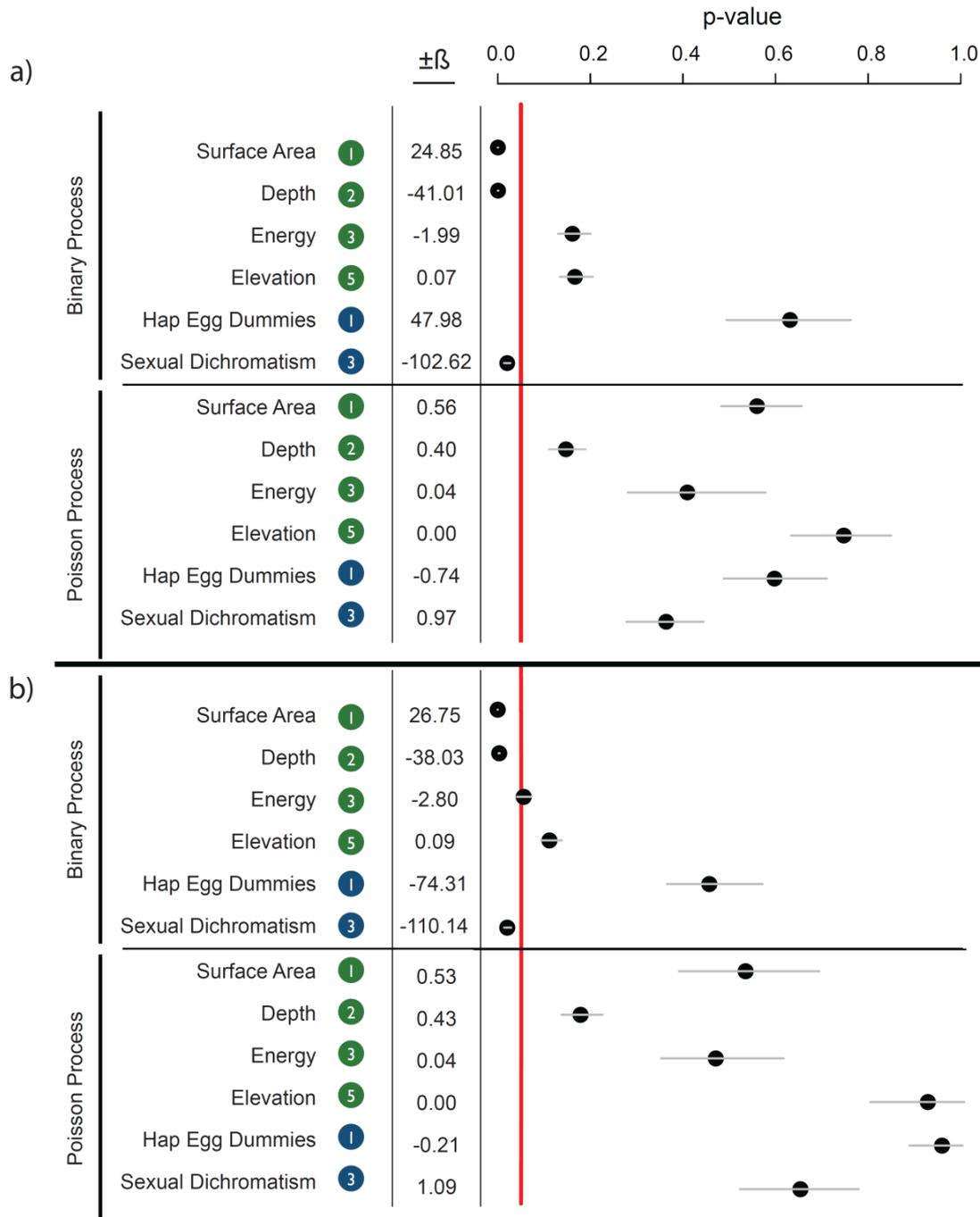
Supplementary Figure 6| Phylogenetic hurdle poisson regression supports lake depth, lake surface area, and sexual dichromatism as significant predictors of cichlid radiation. Energy is a significant predictor in analyses excluding data from Lake Tanganyika. These results are concordant with those of logistic regression analyses (compare to Figure 2a and b). a) Results from analysis of the full dataset; b) results with lineages in Lake Tanganyika removed. In both cases, no tested variables are supported as significant predictors of the species richness of cichlid radiations under a poisson regression model. Regression parameter estimates (labeled ±ß) are the means taken from analyses replicated across a set of 100 bootstrap replicate trees. Positive values indicate an increased likelihood that there is no radiation. Significance values (p-values) plotted represent the mean and 95% confidence intervals of values for the 100 replicate analyses (red line corresponds to p = 0.05). Colored dots correspond to the variable numbers shown in Figure 2.